"A study to assess the knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh."

Dissertation

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ALL INDIA INSTITUTE OF MEDICAL SCIENCES,

BHOPAL

In partial fulfillment of the requirement for the degree of

M.Sc. in Community Health Nursing

By

Vishvendra Singh Dagur

Enrollment No: 2300075N07P79007

Under the guidance of

Dr. Anurag Bhai Patidar

Associate Professor

Nursing College, AIIMS Bhopal

July, 2025

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Guide:

Dr. Anurag Bhai Patidar
Associate Professor
Nursing College, AIIMS, Bhopal

डॉ. अनुराग भाई पाटीदार/Dr. Anurag Bhai Patidar
सहायक प्राध्यापक/Associate Professor
नर्सिंग महाविद्यालय/Nursing College
एम्स भोपाल, मध्य प्रदेश-462020
AIIMS Bhopal, (M.P.)-462020

Co-Guide:

Mr. Kumarasamy AP
Assistant Professor, Nursing College
AIIMS Bhopal

कुमारसामी ए पी/Kumarasamy AP
सहायक प्रोफेसर/Assistant Professor
नर्सिंग महाविद्यालय/Nursing College
एम्स भोपाल, मध्य प्रदेश-462020
AIIMS Bhopal, (M.P.)-462020

Co-Guide:

Dr. Bhupeshwari Patel
Associate Professor, Trauma E.M.
AIIMS Bhopal

Dr. Bhupeshwari Patel
Associate Professor
Dept. of Trauma & Emergency Medicine
(Pediatrics)
AIIMS, Bhopal-462020

Place: Bhopal

Date:

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, BHOPAL

CERTIFICATE

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प्रभारी प्राचार्या/In-Charge PRINCIPAL
नर्सिंग महाविद्यालय/Nursing College
भोपाल/Bhopal मध्य प्रदेश-462020
28/12/2025
Dr. Mamta Verma
AIIMS Bhopal, Madhya Pradesh-462020

Principal I/C

Nursing college

AIIMS, Bhopal

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, BHOPAL

DECLARATION

I hereby declare that the dissertation entitled "A study to assess the knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh." is a Bonafide and original work carried out by me under the supervision and guidance of **Dr. Anurag Bhai Patidar (Guide)**, Associate Professor, Nursing College, AIIMS Bhopal, **Mr. Kumarasamy AP (Co-Guide),** Assistant Professor, Nursing College, AIIMS Bhopal & **Dr. Bhupeshwari Patel (Co-Guide),** Associate Professor, Trauma E.M. AIIMS Bhopal. The dissertation or any part there of has not formed the basis for the award of any degree/ fellowship or similar title to any candidate of any University to the best of my knowledge.

Mr. Vishvendra Singh Dagur

Place: Bhopal

Date:

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Mr. Vishvendra Singh Dagur

Guide:

Dr. Anurag Bhai Patidar
Associate Professor
Nursing College, AIIMS, Bhopal

Co-Guide:

Mr. Kumarasamy AP
Assistant Professor, Nursing College
AIIMS Bhopal

Co-Guide:

Dr. Bhupeshwari Patel
Associate Professor, Trauma EM
AIIMS Bhopal

Place: Bhopal

Date

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96,763	13,552	1482	54 min 12 sec	1 hr 44 min
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Writing Issues

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Plagiarism

152 sources

7% of your text matches 152 sources on the web or in archives of academic publications

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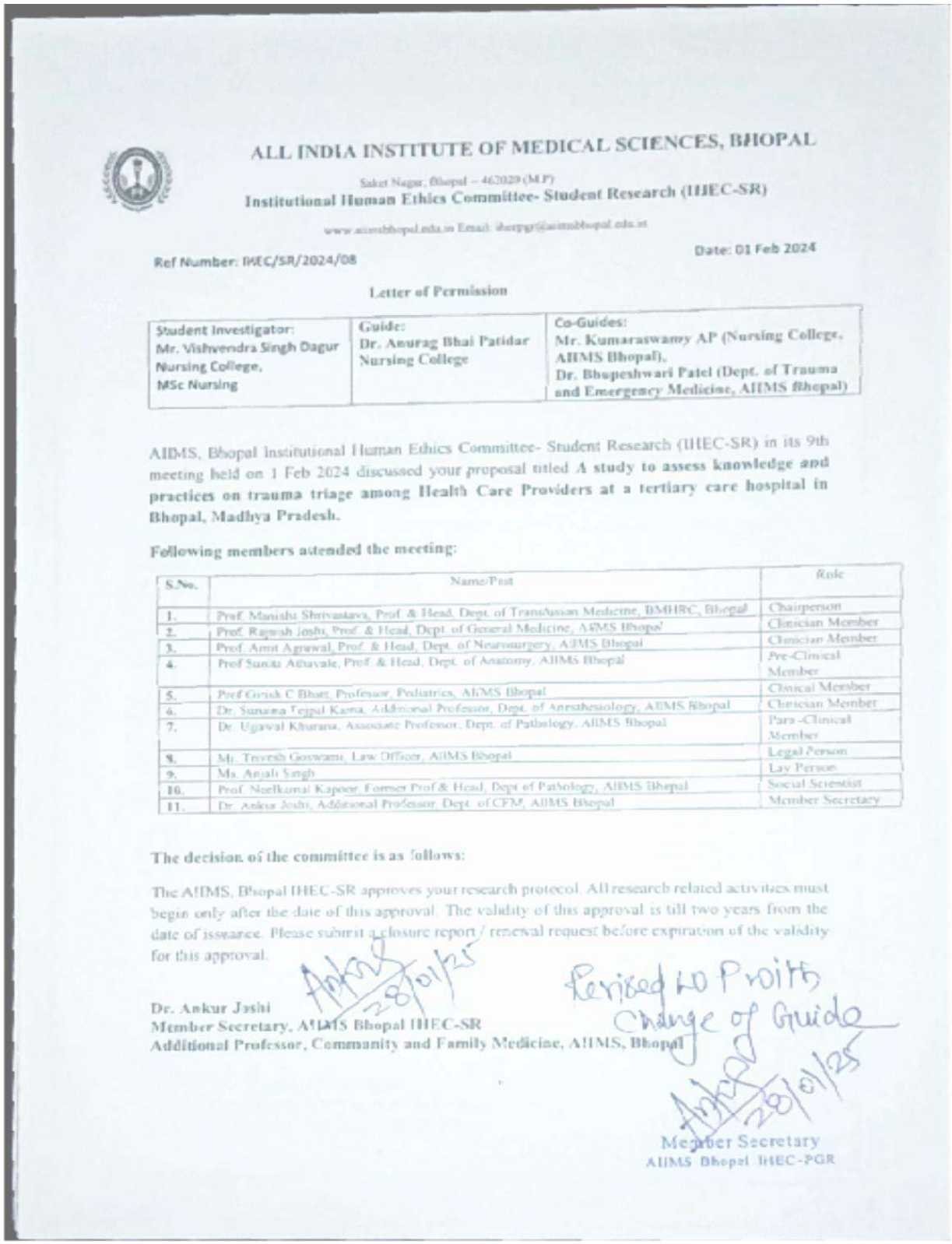

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Institutional Human Ethics Committee- Student Research (IHEC-SR)

www.aiimsbhopal.edu.in Email: ihecpgr@aiimsbhopal.edu.in

Ref Number: IHEC/SR/2024/08

Date: 01 Feb 2024

Letter of Permission

Student Investigator: Mr. Vishvendra Singh Dagur Nursing College, MSc Nursing	Guide: Dr. Anurag Bhai Patidar Nursing College	Co-Guides: Mr. Kumaraswamy AP (Nursing College, AIIMS Bhopal), Dr. Bhupeshwari Patel (Dept. of Trauma and Emergency Medicine, AIIMS Bhopal)

AIIMS, Bhopal Institutional Human Ethics Committee- Student Research (IHEC-SR) in its 9th meeting held on 1 Feb 2024 discussed your proposal titled **A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh.**

Following members attended the meeting:

S.No.	Name/Post	Role
1.	Prof. Manishi Shrivastava, Prof. & Head, Dept. of Transfusion Medicine, BMHRC, Bhopal	Chairperson
2.	Prof. Rajnish Joshi, Prof. & Head, Dept. of General Medicine, AIIMS Bhopal	Clinician Member
3.	Prof. Amit Agrawal, Prof. & Head, Dept. of Neurosurgery, AIIMS Bhopal	Clinician Member
4.	Prof Sunita Attuvale, Prof. & Head, Dept. of Anatomy, AIIMS Bhopal	Pre-Clinical Member
5.	Prof Girish C Bhatt, Professor, Pediatrics, AIIMS Bhopal	Clinical Member
6.	Dr. Sunaina Tejpal Kaina, Additional Professor, Dept. of Anesthesiology, AIIMS Bhopal	Clinician Member
7.	Dr. Ugaval Khurana, Associate Professor, Dept. of Pathology, AIIMS Bhopal	Para -Clinical Member
8.	Mr. Tavesh Goswami, Law Officer, AIIMS Bhopal	Legal Person
9.	Ms. Anjali Singh	Lay Person
10.	Prof. Neelkamal Kapoor, Former Prof.& Head, Dept of Pathology, AIIMS Bhopal	Social Scientist
11.	Dr. Ankur Joshi, Additional Professor, Dept. of CFM, AIIMS Bhopal	Member Secretary

The decision of the committee is as follows:

The AIIMS, Bhopal IHEC-SR approves your research protocol. All research related activities must begin only after the date of this approval. The validity of this approval is till two years from the date of issuance. Please submit a closure report / renewal request before expiration of the validity for this approval.

Ankur 28/01/25

Revised to Prof's Change of Guide

Ankur 28/01/25

Dr. Ankur Joshi
Member Secretary, AIIMS Bhopal IHEC-SR
Additional Professor, Community and Family Medicine, AIIMS, Bhopal

Member Secretary
AIIMS Bhopal IHEC-PGR

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ABSTRACT

Introduction

Trauma is a leading cause of death worldwide, particularly among young adults, with road traffic accidents being a major contributor. In India, road accidents claimed 1,53,972 lives in 2021, with the 18–45 age group being the most affected. Effective trauma care relies on timely and accurate triage, which prioritizes patients based on the severity of their condition. Globally, systems like the Emergency Severity Index (ESI) are widely used, but India lacks a standardized triage system, leading to inconsistencies in emergency care. The AIIMS Triage Protocol (ATP), implemented at AIIMS New Delhi, categorizes patients into "Red," "Yellow," and "Green" groups to manage high patient inflows effectively. Despite its effectiveness, variations in triage practices persist due to differences in healthcare providers' knowledge, experience, and training. Studies show that structured triage training improves decision-making, reduces overcrowding, and enhances patient outcomes. Strengthening triage protocols and standardizing training programs can enhance trauma care in India, addressing the urgent need for an effective, nationwide emergency response system.

Methodology

A cross-sectional study was conducted among 52 Health Care Providers working in AIIMS Bhopal, Madhya Pradesh. Data were collected through self-structured questionaries method and Practice Assessment Tool in Emergency department. Knowledge and Practice categorized as good, satisfactory, poor and Statistical tests were used to assess the associations between sociodemographic variables and the knowledge and practice of health care providers. Data were analyzed using SPSS version 27.

Result

The study found that 71.2% had good knowledge (>75%), while 28.8% had a satisfactory level (50-74%), with no participants scoring poorly. In practice, 92.3% demonstrated good competency, and 7.7% had satisfactory practice, with none showing poor practice. The chi-square test revealed no significant association between knowledge levels and factors like age, gender, qualification, designation, training, or clinical experience. Similarly, practice levels were not significantly associated with most sociodemographic variables except educational qualification, which had a statistically significant impact ($p = 0.02$). The study highlights adequate knowledge and practice among participants while emphasizing the need for continuous training and exploring factors beyond demographics to enhance trauma triage proficiency.

Conclusion

The study highlights the good knowledge and practice levels of healthcare providers in trauma triage at AIIMS Bhopal, with education being a key factor in practice proficiency. Despite strengths, gaps remain that require continuous training and professional development, especially for less experienced providers. Future research should explore non-traditional factors like motivation and institutional culture to enhance trauma care quality and consistency.

Keywords: AIIMS Bhopal, Healthcare providers, Knowledge assessment, Practice assessment, Tertiary care hospital, Trauma triage

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LIST OF ABREVIATIONS

AIIMS	All-India Institute of Medical Sciences
ATCN	The Advanced Trauma Care for Nurses
ATLS	Advanced Trauma Life Support
ATP	AIIMS Triage Protocol
BLS	Basic Life Support (BLS)
ED	Emergency Department
ESI	Emergency Severity Index
GCS	Glasgow Coma Scale
Health Care Providers	Resident Doctors, MBBS interns and Nursing Officers (Nursing Officers and Senior Nursing Officers)
IHEC-SR	Institutional Human Ethical Committee- Student Research
PALS	Pediatric Advanced Life Supports
PAT	Pediatric Assessment Triangle
SPSS	Statistical Package for Social Sciences
TEM	Trauma and Emergency Medicine
WHO	World Health Organization

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CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

Background of the study

Trauma is the one of the major causes of death worldwide among children and young people (World Health Organization (WHO), 2021, Many results from suicide attempts, which globally account for >50% of all violent deaths in men and 71% in women (WHO, 2014). As well as the physical consequences of trauma, people can also experience emotional or psychological difficulties, which may become long-term disabilities (WHO, 2021.) [1]

During the year 2021, a total number of 4,12,432 road accidents have been reported in the country, claiming 1,53,972 lives and causing injuries to 3,84,448 persons. Unfortunately, the worst affected age group in Road accidents is 18-45 years, which accounts for about 67 percent of total accidental deaths. At least one out of 10 people killed on roads across the world is from India, according to the World Health Organization. Ministry of Road Transport & Highways 2021[2]

Trauma triage is fundamental aspect of patients care. In recent years, studies found that triage has a positive role on patient/nurse satisfaction level. Criteria for trauma triage are based on physiological parameters, specific anatomical injuries and the underlying mechanism of injury[3].

Approximately 70 patients per week visited in trauma emergency department of AIIMS Bhopal. The national emergency medical service system has been established to reduce preventable deaths and morbidity through timely and effective prehospital care and proper treatment upon hospital arrival. A critical component of this system is triage, which ensures that patients are classified according to the urgency of their condition, allowing for timely and appropriate treatment. The Emergency Severity Index (ESI) is the most

commonly used triage system in Thai hospitals, categorizing patients into five levels based on the severity of their condition. Accurate triage is essential as it reduces waiting times, prevents overcrowding, and improves patient outcomes. Nurses play a crucial role in assessing patients and assigning appropriate triage levels, with the accuracy of these decisions influenced by both their expertise and patient characteristics. [4]

The literature reveals that the Knowledge and practice on the trauma triage is associated with qualification, year of experience, training courses of the triage, previous training during the course, ways of transportation, hospital-based triage practicing, physiological parameters, specific anatomic injuries, underlying mechanism of injuries etc. [5]

Triage is a systematic, algorithm-based method used for the rapid evaluation of emergency patients to prioritize them based on the severity of their condition. In mass casualty situations or disasters, triage plays a critical role in efficiently managing resources to ensure the best possible outcomes. Pediatric triage, which relies on a quick initial assessment using the Pediatric Assessment Triangle (PAT), helps in swiftly identifying life-threatening conditions.[6]

India, with its vast population, faces a significant burden of medical emergencies, but the field of emergency medicine (EM) is still relatively new in the country. Currently, there is no standardized evidence-based triage system used nationwide in emergency departments (EDs). At the All-India Institute of Medical Sciences (AIIMS), New Delhi, a unique ED triage protocol known as the AIIMS Triage Protocol (ATP) has been in place since 2010. This protocol, which categorizes patients into "Red," "Yellow," and "Green" groups based on urgency, was developed due to the overwhelming number of patients, lack of trained emergency personnel, and complexities in implementing international triage systems. The ATP has shown promising results in reducing both over triage and under triage rates, and its adoption across various regions of India highlights its relevance

and effectiveness in managing emergencies within the country.[7]

In the emergency department (ED), effective triage is essential to classify patients based on the severity of their condition into emergent, urgent, and non-urgent categories. Trauma triage is a critical aspect of patient care, as it ensures timely treatment for those in need. Studies have shown that accurate triage not only improves patient outcomes but also enhances nurse and patient satisfaction. Trauma triage decisions are based on vital signs, physiological parameters, and the nature of the injury, making it a key determinant of a patient's prognosis. The competency of nurses, developed through education and experience, plays a vital role in the accuracy of triage decisions.[3]

Many hospitals in these regions lack formal triage systems, leading to delays in identifying and treating critically ill patients. A study conducted in seven developing countries revealed that inadequate triage and emergency care posed significant risks to patients' lives. Organized triage systems, such as the South African Triage Score, have shown success in reducing waiting times and mortality. Early intervention by nurses, based on simple physiological parameters, has proven to be effective in both developed and low-income settings, improving patient outcomes even before a diagnosis is made. This highlights the importance of implementing structured triage systems to ensure timely care and improve survival rates.[5]

The Advanced Trauma Care for Nurses (ATCN) is a specialized training program designed as the nursing counterpart to the Advanced Trauma Life Support (ATLS) course, supported by the Society of Trauma Nurses (STN). These programs aim to improve the early assessment, stabilization, and management of trauma patients through a collaborative approach involving both doctors and nurses. Studies have shown that nurses who complete the ATCN or ATLS programs demonstrate enhanced knowledge and skills in trauma care, leading to improved patient outcomes. However, there is limited research

on the specific impact of these programs on emergency nurses' trauma care capabilities. This review aims to explore the effects of ATLS/ATCN training on the skills and knowledge of emergency nurses in managing trauma patients.[8]

Need for the study

Insufficient knowledge and skill in trauma triage among Health Care Provider may lead to harmful delays in providing timely emergency care, thereby increasing the risk of avoidable disabilities.

Getting triage right, or sorting patients by urgency, makes treatment faster. This helps trauma patients by reducing waiting times, lowering the risk of long-term disability, and decreasing the chance of people passing away. Checking how well triage is done mostly depends on how well health care providers make decisions. If health care providers get better at making good triage decisions, it improves how triage works and makes outcomes better for patients.

Triage is a challenging task that demands experienced staff and the availability of precise criteria in the form of a checklist or protocol. Trauma triage protocol exists at AIIMS Bhopal; however, no data/report is available on knowledge and practice of Health Care Providers working in Trauma and Emergency Medicine (TEM) department of AIIMS Bhopal. Hence this study is planned to generate evidence on the current practice of triage and the need for training programmes if any

Research problem statement

"A study to assess the knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh."

Research Question

1. What is the level of knowledge and practice on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal?

2. What are the factors associated with knowledge and practice of trauma triage among Health Care Providers?

Objective:

1. To assess the knowledge and practice of Health Care Providers on trauma triage at a tertiary care hospital in Bhopal.
2. To identify factors associated with the good knowledge and practice of trauma triage.

Operation Definitions

Triage: It's a well-organized method where patients are sorted based on seriousness of their presenting health issues.

Trauma triage: In this study, it refers to a structured process of categorizing trauma patients according to the treatment needs (Red, Yellow and Green), as per the AIIMS Bhopal triage protocol practiced in TEM department.

Health Care Providers: In this study, it refers to the Resident Doctors, MBBS interns and Nursing Officers (Nursing Officers and Senior Nursing Officers) working in Trauma and Emergency Medicine Department of AIIMS Bhopal.

Knowledge: In this study, refers to the concept, assessments made, the category assigned and the primary interventions related to trauma triage at the place of incident or at the emergency department, and is assessed using a self-structured knowledge questionnaire. Knowledge will be described as: poor (if the total score is <50%); satisfactory (if score is 50 to 75%) and; good (if score is >75%).

Practice: In this study, practice refers to the observed actions and procedures performed by healthcare providers during triage assessment in the emergency department. It includes proper documentation of patient details, assessment of vital signs (respiratory rate, pulse, blood pressure, and SPO_2), evaluation using the GCS/AVPU scale, and appropriate categorization of patients according to the AIIMS Bhopal triage protocol. Practice will be assessed using a structured observational checklist comprising 12 key activities. Each correctly performed activity will be awarded one mark score, while incorrect or unperformed activities will receive zero-mark score. Based on the total score, practice will be described as poor (if the total score is <50%); satisfactory (if score is 50 to 75%) and; good (if score is >75%).

Conceptual Framework:

The Donabedian Model is a widely recognized framework for evaluating the quality of healthcare delivery services. This conceptual model consists of three interrelated components: Structure, Process, and Outcome, all of which collectively influence the quality of care. According to Donabedian's approach, a good structure enhances the likelihood of a smooth and effective care delivery process, which subsequently improves health outcomes. This model has been applied across various healthcare contexts, including the assessment of trauma triage practices. **In this study, titled "A study to assess the knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh,"** the Donabedian Model serves as the conceptual framework to evaluate how structural, procedural, and outcome factors interconnect to influence trauma triage quality.

This framework links the structural factors, processes, and outcomes in trauma triage practices. **Structure** refers to the characteristics of healthcare providers, patients, and organizational settings that influence trauma triage practices. **Process** represents the

actions performed by healthcare providers in assessing, categorizing, and managing trauma patients during triage. Finally, **Outcome** evaluates the effectiveness of these processes in terms of knowledge, practice levels, and triage accuracy.[4]

CONCEPTUAL FRAMEWORK

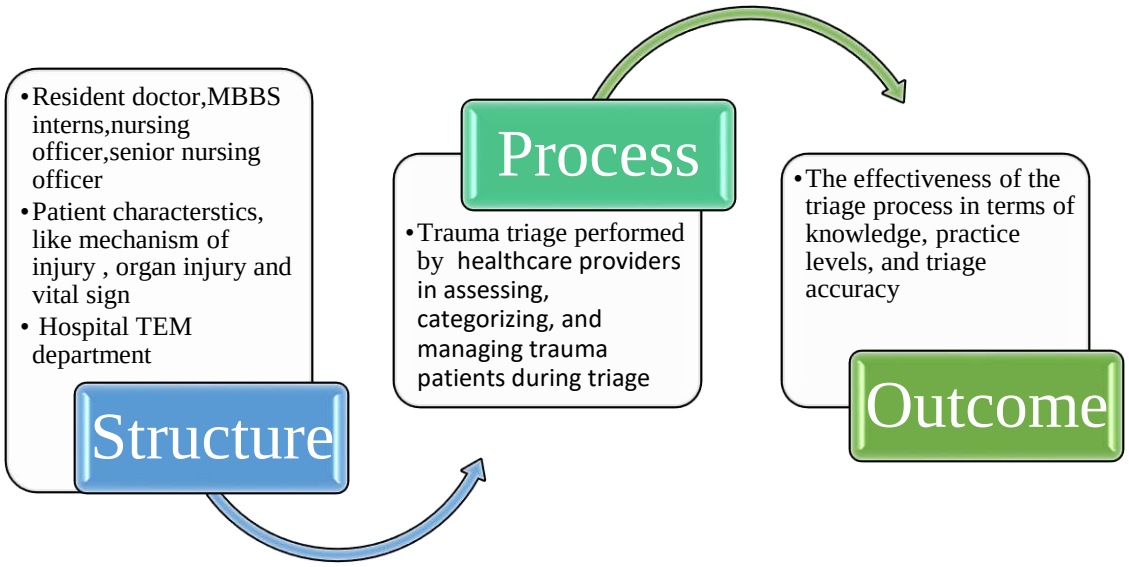

•Resident doctor,MBBS interns,nursing officer,senior nursing officer
•Patient characterstics, like mechanism of injury , organ injury and vital sign
• Hospital TEM department
Structure
Process
•Trauma triage performed by healthcare providers in assessing, categorizing, and managing trauma patients during triage
•The effectiveness of the triage process in terms of knowledge, practice levels, and triage accuracy
Outcome

Fig 1: Integration of Donabedian model into the Study

1. Structure: -Refers to the characteristics of healthcare providers, patients, and organizational settings that influence trauma triage practices.

A. Healthcare Provider Characteristics: - These include attributes of the healthcare providers involved in trauma triage:

Designation: Resident Doctors, MBBS Interns, Nursing Officers, and Senior Nursing Officers.

Experience: Years of work in Trauma and Emergency Medicine (TEM).

Trauma triage training and familiarity with AIIMS Bhopal Triage Protocol.

B. Patient Characteristics

Patient-related factors that influence triage decisions:

Age: Older adults and pediatric patients may require special considerations.

Mechanism of Injury: Types of traumas (e.g., road traffic accidents, falls, or blunt force injuries).

Types of Organ Injuries: Severity of injuries (head trauma, chest injuries, abdominal injuries).

Vital Signs: Glasgow Coma Scale (GCS), systolic blood pressure, pulse. temperature and respiratory rate, etc.

C. Organizational Characteristics

Infrastructure: Availability of a structured triage area in the TEM department.

Support: Accessibility of consultants and TEM experts for validation.

Protocols: AIIMS Bhopal triage protocol outlining red, yellow, and green categories.

2. Process: - Represents the actions performed by healthcare providers in assessing, categorizing, and managing trauma patients during triage.

Knowledge of Trauma Triage: -Knowledge includes theoretical understanding of the triage process:

Concept of trauma triage, primary assessments, and interventions.

Categorization of patients using the AIIMS Bhopal Triage Protocol (Red = emergency, Yellow = urgent, Green = non-urgent).

Assessment tool: Self-structured knowledge questionnaire to classify knowledge as:

Good: (>75% score).

Satisfactory: (50-75% score).

Poor: (<50% score).

B. Practice of Trauma Triage

Practice reflects the application of triage protocols during real patient encounters:

Triage Steps:

Patient Assessment: Initial evaluation of vital signs, injuries, and co-morbidities.

Categorization: Assigning Red, Yellow and Green labels based on AIIMS Bhopal triage protocol.

Validation: it is done on based practice score.

Classification: Practice is categorized as:

Good: (>75% score).

Satisfactory: (50-75% score).

Poor: (<50% score).

3. Outcome: - Assesses the effectiveness of the process in terms of knowledge, and practice.

A. Knowledge and Practice Levels

Knowledge Levels: Poor, Satisfactory and Good based on questionnaire scores.

Practice Levels: Poor, Satisfactory and Good based on observed adherence to AIIMS Bhopal triage protocol.

Explanation:

The study can be visually represented as a diagram linking **Structure**, **Process**, and **Outcome.**

1. **Structure** (Input): Healthcare provider characteristics, patient demographics, organizational resources.
2. **Process**: Triage knowledge and practice on trauma triage among health care providers (assessed through questionnaires and checklists).
3. **Outcome**: Measured through knowledge scores and practice score.

Summary:

This framework allows the study to assess both knowledge and practical application of trauma triage among healthcare providers, showing how different levels of expertise impact trauma triage performance. Using **Donabedian model** the framework connects the knowledge healthcare providers have with their level of experience and how that influences their real-world practice.

CHAPTER II

REVIEW OF LITERATURE

A literature review is systematically conducted to contextualize a research problem andpinpoint deficiencies in prior studies, thus warranting a new investigation. It forms the groundwork for generating fresh knowledge by delving into existing research, offering a conceptual framework, and guiding the research approach. The review aims to uncover past efforts, methodologies employed by other researchers, and how their findings can be amalgamated to advance understanding in the field.[18]

Extensive exploration of both research and non-research literature from platforms such as Google Scholar, Research-gate, PubMed, Scopus, Wiley Online Library, and Cochrane was conducted to acquire comprehensive insights into various facets of the current study's problem. The search terms employed included caregiver burden, social support, family well-being and the relationship between caregiver burden, social support and family well-being.

The Review is organized under the following headings:

A. Knowledge on trauma triage

B. Practice on trauma triage

C. Knowledge and Practice on trauma triage among Health Care Providers.

A) Knowledge

A study conducted by Samia Eaid Elgazzar (2021) assessed triage knowledge among 48 nurses working in the emergency department at Burridah Central Hospital, Qassim region, Saudi Arabia. The findings revealed that nurses exhibited moderate levels of triage knowledge, influenced by key factors such as educational qualification, professional experience, and participation in training programs.

Nurses holding a Bachelor of Science in Nursing ($p = 0.005$), with ≥5 years of experience ($p = 0.002$), and those who had attended triage training courses ($p = 0.001$) demonstrated significantly higher levels of knowledge. These results underscore the importance of structured educational initiatives and ongoing training to enhance triage competencies, ultimately improving the quality of emergency nursing care and patient outcomes.[9]

A quasi-experimental study conducted by Dalia Abdallah et al. in the Surgical Emergency Department of El-Demerdash Hospital and Nasser Institute Hospital assessed the impact of educational guidelines on nurses' trauma triage knowledge and practices. The study included 60 emergency nurses and 200 trauma patients, utilizing tools such as pre- and post-tests for knowledge, observation checklists for practices, and patient satisfaction assessments. Findings revealed that less than half of the nurses were aged 20–30 years and held a diploma degree. Post-test results demonstrated a significant improvement in nurses' knowledge and practices, highlighting the effectiveness of educational guidelines in enhancing nurses' competencies. The study concluded that improved knowledge and self-efficacy positively influenced the accuracy of trauma triage, patient outcomes, and satisfaction levels, emphasizing the importance of structured training programs in emergency nursing.[3]

A cross-sectional study by Varun Anand et al. assessed the knowledge and proficiency of 5,029 nursing officers (NOs) across India in pediatric triage, highlighting gaps in their understanding and application of triage protocols. The majority of participants were nursing graduates (82.52%), predominantly employed in government healthcare facilities (84.01%), and experienced in emergency care (>5 years, 70.77%). The study revealed inadequate knowledge of the Pediatric

Assessment Triangle (PAT) (62.18%) and limited awareness of key components of pediatric triage, including primary (28.27%) and secondary (22.69%) surveys, temperature and glucose assessments, and internationally recognized triage systems such as the Emergency Severity Index (ESI) and Canadian Triage and Acuity Scale (CTAS) (15.87%). ANOVA and post hoc analyses highlighted the influence of higher qualifications, government employment, and extensive ED experience on triage knowledge. The findings emphasized the need for structured training and assessment programs to enhance the cognitive and psychomotor competencies of NOs, bridging knowledge gaps and improving pediatric triage efficacy in Indian healthcare settings.[6]

A descriptive correlational observational study by Malakeh Z. Malak, et al. evaluated the knowledge, skills, and practices of triage among 125 emergency nurses working in triage units across government, educational, and private health sectors in Jordan. The findings revealed that 88.8% of nurses possessed sufficient knowledge of triage, with a significant positive association between triage knowledge and factors such as emergency experience and participation in triage training courses. The study emphasized that knowledge was further enhanced by cumulative triage experience and structured training programs. These results underscore the importance of establishing nursing policies that prioritize triage as a baseline training component for emergency nurses. The authors advocate for targeted educational initiatives to strengthen triage competencies, thereby improving the quality of care and patient outcomes in emergency settings.[10]

A prospective observational study conducted by Thassanee Soontorn et al. assessed the accuracy of triage performed by registered nurses (RNs) in five emergency departments (EDs) in southern Thailand using the Emergency Severity Index (ESI)

Version 4. The study included 109 RNs and 1,090 trauma patients. Findings indicated that nearly half of the patients (47.6%) were inaccurately triaged, with 25.5% over-triaged and 15.2% under-triaged. ESI Level 2 accounted for the highest rate of under-triage, with musculoskeletal injuries, multiple organ injuries, and traumatic brain injuries being common in inaccurately triaged cases. Nurses performed poorly in pain assessments, as only 18% of patients had pain levels documented. Triage inaccuracies were linked to factors such as patient characteristics, including type of injury and altered consciousness, highlighting the importance of structured triage tools and targeted training to improve nurses' knowledge and decision-making skills in ED triage practices. Findings revealed that only 52.4% of patients were accurately triaged, with factors such as years of experience in the ED influencing the likelihood of over-triage. Patient characteristics, including blunt injuries, multiple injuries, and altered consciousness, were associated with triage inaccuracies. The study emphasized that triage accuracy is crucial for timely and appropriate treatment to reduce trauma-related mortality and disability. The authors highlighted the importance of adopting standardized tools like ESI Version 4 to enhance decision-making competencies and improve triage outcomes in ED settings.[4]

A study by Robert Aloyce et al. in Dar es Salaam, Tanzania, highlighted critical deficits in triage knowledge and skills among 66 emergency care nurses from a national hospital and three municipal district hospitals. Using a structured questionnaire, observational checklist, and triage equipment audit, the study revealed that 33% of nurses lacked basic triage knowledge, and over half (52%) could not allocate patients to the correct triage category. Furthermore, 58% were unaware of waiting time limits for triage categories, and critical assessments like

respiratory rates and pain levels were often omitted, with 84% and 100% of nurses failing to assess these, respectively. Only one of the four facilities had dedicated triage nurses, triage guidelines, or forms in place. These findings underscore the urgent need for in-service training, regular professional development programs, and the establishment of standardized triage protocols to enhance nurses' knowledge and competence in emergency care settings.[5]

A study conducted by Mohammad AlShatarat et al. at King Fahad Medical City (KFMC), Saudi Arabia, explored the triage knowledge of 147 emergency department (ED) nurses using a cross-sectional, descriptive, and correlational design. The study revealed that participants had a high level of knowledge regarding the purpose and principles of triage, such as prioritizing patients to prevent deterioration or death (98.6% agreement). However, some areas of knowledge deficits were identified, including misunderstandings related to specific triage protocols like the AVPU scale, where 68.7% of nurses incorrectly associated "P" with pulse instead of pain. Nurses self-rated their triage knowledge and training quality at a mean score of 7.3 on a 10-point scale, reflecting overall competence but highlighting the need for targeted training to address gaps in knowledge and practice. The study emphasizes the importance of ongoing professional development and specialized education to bridge these gaps and enhance triage efficiency in emergency care.[11]

A quasi-experimental study by Anas Adeeb Shawah'en et al. in Amman, Jordan, assessed the impact of an online triage educational program on emergency nurses' knowledge and skills using a one-group pretest-post-test design. Conducted in collaboration with the Jordanian Nurses' Council, the study included 102 registered nurses recruited through convenience sampling. Before the intervention, nurses

demonstrated moderate knowledge and skills in triage, with pre-test mean scores of 7.80 (SD ± 4.4) and 105.65 (SD ± 35.01), respectively. Post-intervention results showed a significant improvement, with mean scores increasing to 13.70 (SD ± 1.7) for knowledge and 155.6 (SD ± 9.6) for skills. Nurses who had prior training in Basic Trauma Life Support (BTLS) and ambulance protocols showed significant differences in knowledge scores. The study highlights the critical role of structured educational programs in enhancing emergency nurses' triage knowledge and skills, thereby improving the quality of care in emergency settings.[12]

A cross-sectional study by Kouro GM et al. explored the knowledge, practice, and perception of triage among 83 emergency department (ED) staff, comprising 56 nurses and 27 doctors, using a structured self-administered questionnaire. The study revealed that 64 participants had at least a moderate level of knowledge of the South African Triage Scale (SATS), significantly associated with work experience ($p = 0.032$) and frequency of triaging ($p = 0.000$). Additionally, 49 participants demonstrated moderate or better triage practice skills, which correlated significantly with their triage knowledge ($p = 0.011$) and frequency of triaging ($p = 0.001$). The study emphasized that frequent triaging positively impacts both knowledge and practice, underscoring the "practice makes perfect" principle. Most participants acknowledged triaging's importance in reducing waiting times (89%) and improving communication (92%). Recommendations included regular on-the-job training, in-service education, and integrating triage concepts into medical and nursing curricula to enhance understanding and practice, especially among ED doctors who are critical to patient care.[13]

A descriptive survey conducted by Sardar Ali, et al. assessed the knowledge of triage among 100 nurses working in emergency units across three teaching hospitals in

Lahore, Pakistan. Data were collected using a self-administered questionnaire, which demonstrated adequate reliability with a Cronbach's α of 0.684. The findings revealed that 69% of the participants had poor knowledge, correctly answering less than 50% of the questions, with an overall correct response rate of 43.22%. These results highlight significant gaps in triage knowledge, underscoring a deficiency in formal training and educational programs related to triage in Pakistan. The study concluded that existing nursing curricula lack sufficient content on triage to adequately prepare nurses for emergency care, necessitating the integration of focused triage education and professional development programs to improve knowledge and practice in emergency settings.[14]

A prospective cross-sectional study by Dr. Dinesh Chandra Joshi et al. assessed the knowledge, attitude, and skills of 53 nurses working in the emergency department of Himalayan Hospital, a tertiary care teaching hospital in Dehradun, India. Data were collected using a pre-tested structured questionnaire and an observational checklist, with statistical analysis performed using SPSS version 23. The findings revealed a statistically significant positive correlation between years of experience and knowledge ($r = 0.35$, $p = 0.02$), suggesting that experience contributes to enhanced understanding of emergency nursing. Additionally, 66.5% of participants demonstrated a positive attitude, while 70.3% displayed good nursing skills, and 60% showcased strong behavioral and communication skills. The study concluded that the knowledge, attitude, and skills of emergency nurses were satisfactory, emphasizing the importance of experience in improving professional competency.[15]

A descriptive cross-sectional study conducted by Sunita Bista, et al. assessed the level of knowledge regarding triage management among 124 nurses with over one

year of experience at Tribhuvan University Teaching Hospital (TUTH), Kathmandu. Using a self-administered structured questionnaire, the study revealed that more than half (52.4%) of the respondents had inadequate knowledge of triage, while only 29% demonstrated a good level of knowledge. The findings highlighted that factors such as age and employment status influenced nurses' knowledge levels. The study concluded that a significant proportion of nurses lacked adequate knowledge about triage management and emphasized the need for in-service training programs to enhance their understanding and competency in triage practice.[16]

An institutional-based cross-sectional study conducted by Bereket Duko, et al. in Hawassa City, Ethiopia, assessed triage knowledge and skills among nurses at Hawassa University Comprehensive Specialized Hospital. Using a systematic random sampling technique, 101 nurses participated in the study. The findings revealed that 48.5% of nurses had poor knowledge of triage, with a mean score of 9.54 (SD = 2.32), despite their self-perceived triage skills being at a good level, with a mean score of 95.75 (SD = 9.56). Triage knowledge was significantly associated with educational level, working experience, and prior triage experience, indicating gaps in theoretical understanding despite adequate skill performance. The study emphasized the need for targeted training and educational interventions to enhance triage knowledge and bridge the gap between knowledge and practice among nurses.[17]

A quantitative, non-experimental study conducted by Thabo Arthur Phukubye, et al. assessed triage knowledge among nurses in the Emergency Departments of Sekhukhune District Hospitals, Limpopo Province, South Africa. Of the 105 nurses in the population, 84 completed structured questionnaires. Data were collected over a month and analyzed using SPSS version 25 and Excel. Findings revealed that 61%

of the nurses were knowledgeable about triage, while 39% demonstrated insufficient knowledge. The study highlights the variability in triage knowledge and underscores the need for targeted educational initiatives and continuous professional development programs to ensure competency in triage practices across all nursing categories in emergency settings.[18]

Practice:

A quasi-experimental study conducted by Dalia Abdallah Abdelatief and colleagues in the Surgical Emergency Departments at El-Demerdash Hospital and Nasser Institute Hospital assessed the practice and competency of 60 emergency nurses in trauma triage using pre- and post-tests. Data collection tools included an observation checklist for practice and self-efficacy assessment sheets. Results revealed that nurses' practices significantly improved post-educational intervention, highlighting initially poor knowledge and practices related to trauma triage. The study concluded that implementing educational guidelines positively impacted nurses' competency, self-efficacy, and the accuracy of trauma triage protocols, ultimately enhancing patient outcomes and satisfaction. This underscores the necessity of continuous professional training to improve triage practices in emergency settings.[3]

A descriptive correlational study by Malakeh Z. Malak and colleagues assessed the triage practices, skills, and knowledge of 125 emergency nurses from government, educational, and private health sectors in Jordan. The findings indicated that 88.8% of participants demonstrated good triage practices, while 84.8% had moderate skills. Positive associations were observed between triage practices, skills, and factors such as emergency experience, triage training, and triage-specific experience. These results underscore the importance of developing nursing policies that mandate triage

as a baseline training program for emergency nurses. The study highlights the need for structured training programs addressing key influencing factors to enhance nurses' triage practices, ultimately improving the quality of care and patient outcomes. It serves as baseline data for evidence-based practices and future research in the field of triage nursing.[10]

A quantitative descriptive cross-sectional study conducted by Robert Aloyce and colleagues in emergency centers of hospitals in Dar es Salaam, Tanzania, revealed significant gaps in triage practices among nurses. The study highlighted that essential triage assessments, such as airway patency, respiratory rate, pain assessment, and circulation status, were often neglected, with 84% of nurses failing to assess respiratory rates and no pain assessments being performed. Additionally, re-assessments of patients awaiting treatment were not conducted, and documentation of triage categories was absent. The availability of basic triage equipment, guidelines, and assessment forms was limited, with only one of four hospitals possessing necessary tools and guidelines. Furthermore, 52% of nurses were unable to allocate patients to appropriate triage categories, and 58% lacked knowledge of waiting time limits. The findings underscore the urgent need for in-service training, regular professional development, and the provision of adequate triage resources to enhance the competency and efficiency of nurses in emergency care settings.[5]

A systematic review by Khalaf Awwad and colleagues examined the knowledge and skills of emergency nurses related to trauma triage. Using PRISMA guidelines, the review analyzed studies from databases like Web of Science, Scopus, and PubMed, covering the period from 1994 to 2019. Among 5266 records screened, only four studies met the inclusion criteria, with all showing moderate to high risk of bias and

none utilizing a robust experimental design. The findings highlighted a significant gap in trauma triage knowledge and skills among emergency nurses, which could negatively impact patient outcomes. Advanced Trauma Life Support (ATLS) and Advanced Trauma Care for Nurses (ATCN) training were identified as effective interventions for improving nursing competencies. The review emphasized that short training programs, ranging from half a day to two days, significantly enhanced nurses' trauma triage skills, although no difference was noted in skill retention whether evaluated immediately or after several months. This underscores the importance of structured training to strengthen triage practices and optimize patient care in emergency settings.[8]

A study conducted by Mohammad AlShatarat and colleagues utilized a descriptive, cross-sectional, and correlational research design to evaluate triage practices among emergency department (ED) nurses at King Fahad Medical City (KFMC), Saudi Arabia. The study included 147 ED nurses, predominantly female (84%) with a mean age of 36 years, and revealed that 69.4% had prior triage training. While the nurses demonstrated high levels of triage practice overall, specific gaps in translating knowledge into effective practice were identified. For instance, incorrect understanding of AVPU scoring and knowledge deficits regarding certain triage principles were noted. These findings highlight the critical role of continued education and tailored training programs in addressing knowledge gaps and refining triage practices. The study emphasizes that enhancing triage knowledge and skills through targeted interventions is crucial for optimizing patient prioritization and ensuring effective care delivery in the high-pressure ED environment.[11]

An exploratory qualitative study conducted by Bipin Adhikari et al. at Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal, explored the triage

process in the emergency department (ED) using observations, interviews, and discussions with patients, caregivers, and healthcare workers (HCWs). The study, which adhered to WHO triage guidelines, identified significant challenges impacting the efficiency of triage practice. These included inadequate knowledge of triage guidelines among HCWs, limited resources, poor hygiene, lack of digital records and payment systems, overcrowding, and insufficient HCW-to-patient ratios. Specific periods, such as evening and night shifts, were noted as particularly strained, leading to less thorough triage practices. The study highlighted the need for improvements, including digitalized patient management systems to reduce waiting times, enhanced resource allocation, better visitor facilities, and upgraded sanitation measures. Despite these challenges, patients expressed satisfaction with the overall care received. The findings underscore the importance of addressing systemic barriers to optimize triage processes and improve service delivery in resource-constrained ED settings.[19]

A cross-sectional study by Kouro GM et al. assessed the knowledge, practice, and perception of triage among emergency department (ED) staff using a structured, self-administered questionnaire. The study included 83 participants, comprising 56 nurses and 27 doctors, with data analyzed for descriptive and bivariate associations. Results revealed that 64 participants had at least a moderate level of knowledge of the South African Triage Scale (SATS), significantly associated with their work experience ($p = 0.032$) and frequency of triaging ($p = 0.000$). Triage practice skills varied, with 35% demonstrating high skill, 24% moderate skill, and 41% low skill levels. Additionally, 59% correctly triaged cases, while 33% over-triaged, and 8% under-triaged. Despite being relatively young (mean age 28 years) and inexperienced, ED staff showed promising knowledge and practice of SATS,

underscoring the value of frequent triage practice and on-the-job training. The study highlighted the importance of continuous education and regular in-service training to enhance triage competence, particularly among ED doctors and nurses, to improve patient outcomes.[13]

A cross-sectional study conducted by Bereket Duko et al. in Hawassa City, Ethiopia, assessed the triage knowledge and skills of nurses at Hawassa University Comprehensive Specialized Hospital. The study involved 101 nurses, recruited using a systematic random sampling technique, with data analyzed for descriptive and logistic regression associations. Results revealed that 51.5% of participants had low triage knowledge scores, with a mean score of 9.54 (SD = 2.32), whereas 76.2% perceived their overall triage skills as good, with a mean score of 95.75 (SD = 9.56). Factors significantly associated with triage knowledge included educational level, working experience, and triage experience ($p < 0.01$). Similarly, working experience and triage experience ($p < 0.05$) were significantly associated with triage skills. Despite good levels of triage skill, the low knowledge scores highlight a gap in understanding, necessitating focused efforts on education and training to strengthen both triage knowledge and application. The study underscores the importance of continuous professional development programs by healthcare institutions to improve triage practices among nurses.[17]

A single-center retrospective cohort study by Jeremiah S. Hinson et al. examined the accuracy of Emergency Severity Index (ESI) score assignments in an emergency department by comparing initial triage scores assigned by nurses with final scores determined by treating physicians after full clinical knowledge. Among 96,071 patient encounters, 16,426 were inaccurately triaged, with under-triage linked to higher hospital admission rates and increased likelihood of critical outcomes, while

over-triage correlated with lower severity outcomes. Multivariate logistic regression identified factors such as advanced age, abnormal vital signs (e.g., bradycardia, tachycardia, hypoxia, hyperthermia), and certain chief complaints (e.g., neurologic issues, chest pain, shortness of breath) as predictors of under-triage, whereas complaints like hypertension and allergic reactions were associated with over-triage. The study highlights gaps in the ESI algorithm, particularly in recognizing high-acuity cases and overestimating low-severity presentations, emphasizing the need for improved triage protocols and additional training for triage staff to enhance decision-making accuracy.[20]

Factors associated with the Knowledge and Practice of trauma triage among Health Care Providers

The knowledge and practice of trauma triage among healthcare providers are influenced by various factors, including educational background, clinical experience, and ongoing training**.** A study by Elgazzar (2021) identified that nurses with a Bachelor of Science in Nursing (BSN) demonstrated significantly better triage knowledge compared to those with lower qualifications. In addition, the length of clinical experience, particularly those with five or more years in emergency settings, was positively correlated with higher levels of triage competency. Experience in the field allows healthcare providers to develop more refined decision-making skills under pressure, improving their ability to prioritize trauma cases effectively. Furthermore, specialized training courses on triage were found to be a crucial factor in enhancing the knowledge and practice of triage. Providers who participated in dedicated triage training programs showed a marked improvement in both their theoretical understanding and practical application of triage principles. This underscores the importance of continuous professional

development and the need for healthcare institutions to prioritize in-service training and education to ensure healthcare providers are well-prepared for effective trauma triage, which ultimately leads to better patient outcomes in emergency care settings. Therefore, strengthening educational frameworks, fostering experience, and emphasizing targeted training are key strategies to enhance trauma triage competencies among healthcare professionals.[9]

The knowledge and practice of trauma triage among healthcare providers are influenced by several key factors, including clinical experience, educational background, and the availability of ongoing training. A study by Soontorn et al. (2015) highlighted the significant role of nurse experience in triage accuracy, revealing that nurses with over ten years of experience tended to over-triage trauma patients, often as a safety measure, which led to overcrowding in emergency departments and inefficient resource utilization. However, the study also emphasized that over-triage, although well-intentioned, could strain hospital resources and delay care for critically ill patients. Additionally, the study showed that the accuracy of trauma triage was affected by the nurses' competency in applying triage algorithms, particularly the Emergency Severity Index (ESI) Version 4. Nurses with inadequate training or those who did not consistently follow the triage protocol were more likely to make triage errors, either under-triaging or over-triaging patients. Therefore, the study underscores the importance of continuous education and training, particularly for experienced nurses, to improve their triage accuracy and to ensure that trauma patients are categorized appropriately for timely and effective care. Ongoing refresher courses and audits are recommended to maintain triage competency and enhance overall nursing performance in trauma settings. These findings align with the Donabedian

framework, where the structure (nurse competency), process (adherence to triage protocols), and outcome (accurate triage leading to better patient outcomes) are interconnected in improving healthcare quality.[4]

The accuracy of trauma triage is significantly influenced by a variety of factors, including the healthcare provider's knowledge, clinical judgment, and experience. In a study conducted by Hinson et al. (2020), it was found that under-triage and over-triage were common in emergency department (ED) settings, with various clinical factors such as advanced age, abnormal vital signs, and specific chief complaints (e.g., chest pain, neurologic issues) acting as predictors of these errors. Under-triage, in particular, was linked to higher admission rates and critical outcomes, highlighting its potentially detrimental effects on patient outcomes. This study underscores the complexity of trauma triage, where clinical presentations may be misinterpreted due to the limitations of triage algorithms like the Emergency Severity Index (ESI), which often fail to adequately address subtle but significant patient conditions. Additionally, despite rigorous and continuous training, the study revealed that a substantial portion of healthcare providers still made inaccuracies in triage decisions, suggesting that there is a need for further refinement in both training and the application of triage tools. Factors such as experience, knowledge, and familiarity with the ESI algorithm are crucial in ensuring accurate triage practices, and ongoing education and audits are essential to improve triage accuracy and optimize patient care outcomes. This aligns with previous findings that triage accuracy improves with experience and proper training, emphasizing the need for regular updates and practical reinforcement to enhance the clinical decision-making process in trauma care.[20]

Summary

This chapter dealt with literature reviews related to Knowledge, Practice and factors associated with the Knowledge and Practice of trauma triage among Health Care Providers.

CHAPTER III

MATERIALS AND METHODS

Research methodology provides a structured approach to address and resolve research problems systematically. This chapter deals in detail with the methodology selected for the present study. It also describes the design, the setting, sampling technique, and description of the instrument, data collection procedure, and the plan for data analysis.

Research approach

Research approach is an effective strategy to increase the validity of research. In view of the nature of problem of the study and to accomplish the research objectives, quantitative, approach was considered to be appropriate to achieve the desired objectives of the study.

Research design

The researcher adopted cross sectional survey design for the present study.

Research setting

The present study was held at All India Institute of Medical Science, Bhopal (AIIMS Bhopal) Madhya Pradesh, India. The hospital is a 1260 bedded referral centre to patients within Madhya Pradesh and central India.

Population

Health Care Providers working in Trauma and Emergency Medicine Department of All India Institute of Medical Science, Bhopal (AIIMS Bhopal) Madhya Pradesh, India.

Sample

Health Care Providers working in Trauma and Emergency Medicine Department of

All India Institute of Medical Science, Bhopal (AIIMS Bhopal) Madhya Pradesh, India.

Sampling Criteria

Inclusion criteria-

Health Care Providers: -

- Working in trauma emergency department for the last 03 months.
- Willing to participate and are available on the day of data collection.
- Available on the day of data collection.

Exclusion criteria: –

- Health Care Providers who are on administrative duty or official work or on training.

Sample size

52 Health Care Providers

Sampling technique:

In this study, total enumerative sampling technique was used. The enumerative sampling technique is more practical and suitable for the researcher to assess knowledge and practice among Health Care Providers.

Data Collection tools/Instruments

Development and description of tool

The most important and crucial aspect of any research is the collection of appropriate information. A tool is an instrument used to gather the actual information desired bythe researcher. Based on the objectives of the study the following data collection tools were used.

Tool 1: Socio-demographic proforma

Tool 2: Knowledge Questionnaire Tool

Tool 3: Observation checklist to assess triage practice

Tool 1: Socio demographic proforma of patient

It includes age (in years), gender, Qualification, Designation, have you attended / completed any of following courses, Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad) Total clinical experience (India or abroad) in years Are you oriented to the triage protocol/guideline at AIIMS Bhopal.

Tool 2: Knowledge Questionnaire Tool

It includes 20 multiple choice question which is based on emergency and all India Trauma Triage protocol. Each correct response to a MCQ is scored as one. Maximum score will be 20. Unanswered or incorrect response will be scored as zero

Interpretation of scores:

1. Good: if scores are >75%
2. Satisfactory: if scores are between 50 to 74%
3. Poor: if scores are less than 50%

Tool 3: Observation checklist to assess triage practice

It consists of total 12 practice assessment scale based on All India Institute Medical Science Bhopal Trauma Triage protocol documentation sheet.

Scoring: Each correct practice is scored as one. Maximum score will be 12. Unanswered or incorrect practice will be scored as zero

Interpretation of scores:

1. Good: if scores are >09 to 12
2. Satisfactory: if scores are between 5 to 08

3. Poor: if scores are less than < 5

Validity and Reliability of the tools

Validity

- **Validity of Tool :**

Tool from 10 experts have been collected and content validity for each section has been calculated.

- S-CVI for Tool 01 – **0.98**
- S-CVI for Tool 02 – **1**
- S-CVI for Tool 03 **- 0.93**

Reliability

Reliability of the tool was assessed by collecting data from 5 study participants.

In this study it is checked by Cronbach's alpha, a way of assessing reliability by comparing the amount of shared variance /covariance.

Cronbach's alpha of 0.815 for knowledge questionnaire tool, hence it is statistically significant and thus tool found to be reliable.

Reliability Statistics	
Cronbach's Alpha	**N of Items**
.815	**5**

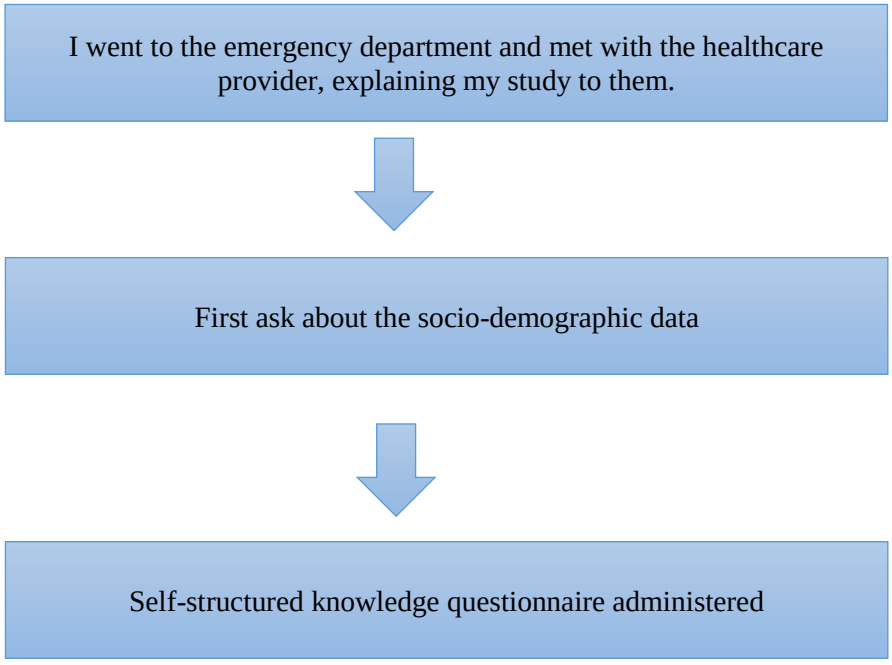
Ethical consideration

Ethical clearance was obtained from Institutional Human Ethical Committee-Student Research, AIIMS Bhopal (Ref No.: IHEC-SR/2024/08). Permission was obtained from Medical Superintendent (Annexure-8) for conducting the study. Permission for using the tools were obtained from respective authors (Annexure-9). Participant information sheet (Annexure 5) was prepared, explained and given to all participants to make aware about the study. Informed consent was obtained from participants (Annexure-6). Privacy, anonymity and confidentiality of the data were assured. Questionnaire were stored under lock and key with the access to researchers only.

Pilot Study

Pilot study was conducted among 5 participants (14/8/23 to 15/8/23) at the tertiary care hospital in Bhopal to assess the feasibility of the study. The study was found feasible. Time taken by caregivers to respond to questionnaires was 15-20 minutes.

Procedure of data collection


I went to the emergency department and met with the healthcare provider, explaining my study to them.
First ask about the socio-demographic data
Self-structured knowledge questionnaire administered

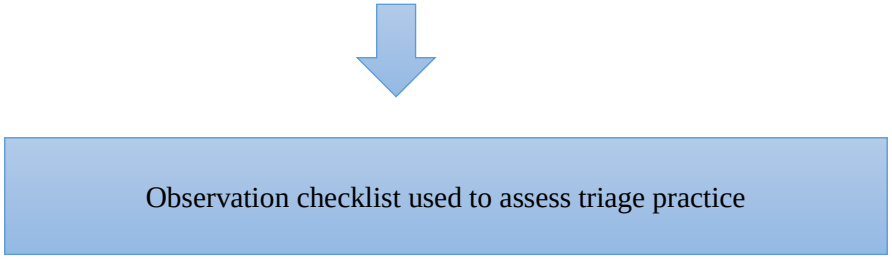


Figure 2. Procedure of data collection

Plan for data analysis

The data was entered in the SPSS software version 27 and master sheet was prepared. The data was analyzed using descriptive and inferential statistics on the basis of objectives of the study.It includes age (in years), gender, Qualification, Designation, have you attended / completed any of following courses, Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad) Total clinical experience (India or abroad) in years Are you oriented to the triage protocol/guideline at AIIMS Bhopal were described in frequency and percentage. The knowledge and practice of Health Care Providers on trauma triage at a tertiary care hospital in Bhopal were assessed by frequency and percentage. Chi-square and fisher exact test were used to find the association of between sociodemographic variables and knowledge. Chi-square and fisher exact test were also used to find the association of between sociodemographic variables and practice.

Summary

This chapter dealt with the research methodology which comprises of research approach, research design, research setting, and population, sampling technique, development of tool, validity, reliability of the tool, description of tool, pilot study, data collection procedure and plan for data analysis.

CHAPTER-IV

RESULT

This chapter contains the result of data collected on patients by health care providers Resident Doctors, MBBS interns and Nursing Officers (Nursing Officers and Senior Nursing Officers) working in Trauma and Emergency Medicine Department of AIIMS Bhopal. It is one of the important parts of research where data collected is systematically analyzed and interpreted.

The result of the study is presented under the followings headings.

Section I: Participant characteristics

Section II: Distribution of Knowledge regarding trauma triage of Health Care Providers

Section III: Distribution of practice regarding trauma triage of Health Care Providers.

Section IV: Association between sociodemographic variables and knowledge on trauma triage of Health Care Providers.

Section V: Association between sociodemographic variables and practice on trauma triage of Health Care Providers.

Section I: Participant characteristics

Table 1: Frequency and percentage distribution of participant characteristics

n - 52

S.N.	Sociodemographic Characteristics	Options	Frequency	Percentage
1.	Age in years	a) 20-25	11	21.2
		b) 26-30	23	44.2
		c) 31-35	16	30.8
		d) 36-40	2	3.8
2	Gender	a) Male	36	69.2
		b) Female	16	30.8
		c) others	0	0
3.	Qualification	a)General Nursing and Midwifery.	2	3.8
		b) B.Sc. (Basic) Nursing/B. Sc (Hons) Nursing	39	75
		c) B.Sc. (Post. Basic) Nursing	1	1.9
		d)M.Sc. Nursing	2	3.8
		e) M.B.B.S	7	13.5
		f) M.D/MS. specify the specialty	1	1.9
4	Designation	a) Nursing officer (NO)	**34**	**65.4**
		b) Senior Nursing officer (SNO)	10	19.2
		c) Junior Resident (JR)	7	13.5
		d) Senior Resident (SR)	01	1.9
		e) Others (specify ------)	0	0
5.	Have you attended / completed any of following courses?	a) ATLS	1	1.9
		b) BLS	36	69.2
		c) ACLS	10	19.2
		d) PALS	0	0
		e)ATCN (advance trauma care for nurses)	5	9.6
		f) Emergency/disaster nursing	0	0
		g) others	0	0
6.	Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad).	a) NO	**35**	**67.3**
		b) YES	17	32.7
7.	Clinical experience in Trauma and	a) NO	1	1.9
		b) YES	51	98.1

	Emergency Medicine department at AIIMS Bhopal.			
8.	Total clinical experience (India or abroad) in years	a) More than 20 (Specify: -----)	0	0
		b) Between 10-20 (Specify -----)	1	1.9
		c) Less than 10 years (specify ----)	**51**	**98.1**
9.	Are you oriented to the triage protocol/guideline at AIIMS Bhopal?	a) NO	0	0
		b) Yes	52	100

A total of 52 healthcare professionals participated, with most aged 26-30 years (44.2%) and predominantly male (69.2%). The majority held a B.Sc. Nursing degree (75%) and worked as Nursing Officers (65.4%). In terms of emergency care training, 69.2% had completed Basic Life Support (BLS), while fewer had advanced training in ACLS (19.2%), ATLS (1.9%), or ATCN (9.6%), and none had PALS or Emergency/Disaster Nursing training. Most participants (98.1%) had experience in the Trauma and Emergency Medicine Department at AIIMS Bhopal, and all were oriented to the triage protocol, with nearly all (98.1%) having less than 10 years of clinical experience.

Section II: Distribution of Knowledge regarding trauma triage of Health Care Providers

Table 2: Frequency and percentage distribution of knowledge among Health Care Providers. **n - 52**

S.N.	**Level Of Knowledge**	**Frequency**	**Percentage**
1	Good (> 75%)	37	71.2%
2	Satisfactory (50-74%)	15	28.8%
3	Poor (< 50%)	0	0%

Knowledge Level of Participants

The assessment of participants' knowledge levels indicated that the majority (71.2%) had a **good level of knowledge** (>75%), while 28.8% demonstrated a **satisfactory level of knowledge** (50-74%). Notably, none of the participants (0%) had a **poor level of knowledge** (<50%). These findings suggest that the overall knowledge among the respondents is adequate, with a significant proportion possessing a high level of understanding. However, the presence of participants in the satisfactory category highlights the need for continuous training and educational interventions to further enhance knowledge levels.

Section III: Distribution of practice regarding trauma triage of Health Care Providers.

Table 3: Frequency and percentage distribution of Practice among Health Care Providers.

N - 52

S.N.	Level Of Knowledge	Frequency	Percentage
1	Good (> 75%)	48	92.3%
2	Satisfactory (50-74%)	4	7.7%
3	Poor (< 50%)	0	0

Level of Practice Among Participants

The findings on the level of practice among participants revealed that the majority (**92.3%**) demonstrated a **good level of practice (score = 3)**, while **7.7%** had a **satisfactory level of practice (score = 2)**. Notably, none of the participants (**0%**) exhibited a **poor level of practice (score = 1)**. These results indicate that most healthcare professionals possess a high level of competency in practice. However, the presence of a small proportion with only a satisfactory level suggests the need for ongoing skill development programs and refresher training to ensure uniform

excellence in clinical practice.

Section IV: Association between sociodemographic variables and knowledge on trauma triage of Health Care Providers.

Table 4: Association between sociodemographic variables and knowledge on trauma triage of Health Care Providers. **N - 52**

S.N.	Sociodemographic Characteristics	Options	Knowledge Score			X^2	P Value
			Poor	Satis	Good		
1.	Age	a) 20-25	0	5	6	2.9	.40
		b) 26-30	0	5	18		
		c) 31-35	0	5	11		
		d) 36-40	0	0	2		
2	Gender	a) Male	0	9	27	.84	0.35
		b) Female	0	6	10		
		c) others	0	0	0		
3.	Qualification	a)General Nursing and Midwifery.	0	1	1	4.9	0.42
		b) B.Sc. (Basic) Nursing/B. Sc (Hons) Nursing	0	13	26		
		c)B.Sc.(Post. Basic) Nursing	0	0	1		
		d)M.Sc. Nursing	0	1	1		
		e) M.B.B.S	0	0	7		
		f) M.D/MS. specify the specialty	0	0	1		
4	Designation	a) Nursing officer (NO)	0	13	21	5.08	0.166
		b) Senior Nursing officer (SNO)	0	2	8		
		c) Junior Resident (JR)	0	0	7		
		d)Senior Resident (SR)	0	0	1		
		e) Others (specify ------)	0	0	0		
5.	Have you attended / completed any of following	a) ATLS	0	0	1	1.22	0.74
		b) BLS	0	10	26		
		c) ACLS	0	4	6		
		d) PALS	0	1	4		

	courses?	e)ATCN (advance trauma care for nurses)	0	0	0		
		f) Emergency/disaster nursing	0	0	0		
		g) others	0	0	0		
6.	Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad).	a) NO	0	11	24	0.38	0.55
		b) YES		4	13		
7.	Clinical experience in Trauma and Emergency Medicine department at AIIMS Bhopal.	a) NO	0	1	0	2.51	0.11
		b) YES	0	15	36		
8.	Total clinical experience (India or abroad) in years	a) More than 20 (Specify: -----)	0	0	0	0.413	0.52
		b) Between 10-20 (Specify -----)	0	0	1		
		c)Less than 10 years (specify ----)	0	15	36		
9.	Are you oriented to the triage protocol/guideline at AIIMS Bhopal?	a) NO	0	0	0	This value is constant	This value is constant
		b) Yes	0	15	37		

*** : Fisher exact test**

Association Between Sociodemographic Variables and Knowledge Level

Chi-square analysis revealed no significant association between knowledge levels and factors like age, gender, qualification, designation, specialized training attendance, or clinical experience both outside and within AIIMS Bhopal. All participants were oriented to the triage protocol, indicating a uniform baseline.

These findings imply that none of the tested sociodemographic or professional factors influenced knowledge levels, underscoring the need for exploring additional variables (e.g., individual motivation, workplace culture, and access to ongoing education) that may affect knowledge.

Section V: Association between sociodemographic variables and practice on trauma triage of Health Care Providers.

Table 5: Association between sociodemographic variables and practice on trauma triage of Health Care Providers. **N - 52**

S.N.	Sociodemographic Characteristics	Options	Knowledge Score			X^2	P Value
			Poor	Satis	Good		
1.	Age	a) 20-25	0	1	10	6.43	0.092
		b) 26-30	0	2	21		
		c) 31-35	0	0	16		
		d) 36-40	0	1	1		
2	Gender	a) Male	0	3	33	0.068	0.79
		b) Female	0	1	15		
		c) others	0	0	0		
3.	Qualification	a)General Nursing and Midwifery.	0	0	2	13.20	0.02
		b) B.Sc. (Basic) Nursing/B. Sc (Hons) Nursing	0	2	37		
		c) B.Sc. (Post. Basic) Nursing	0	1	0		
		d)M.Sc. Nursing	0	0	2		
		e) M.B.B.S	0	1	6		
		f) M.D/MS. specify the specialty	0	0	1		
4	Designation	a) Nursing officer (NO)	0	3	31	1.40	0.70
		b) Senior Nursing officer (SNO)	0	0	10		
		c) Junior Resident (JR)	0	1	6		
		d) Senior Resident (SR)	0	0	1		

		e) Others (specify ------)	0	0	0		
5.	Have you attended / completed any of following courses?	a) ATLS	0	0	1	2.0	0.57
		b) BLS	0	3	33		
		c) ACLS	0	0	10		
		d) PALS	0	1	4		
		e)ATCN (advance trauma care for nurses)	0	0	0		
		f) Emergency/disaster nursing	0	0	0		
		g) others	0	0	0		
6.	Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad).	a) NO	0	3	32	.117	0.733
		b) YES	0	1	16		
7.	Clinical experience in Trauma and Emergency Medicine department at AIIMS Bhopal.	a) NO	0	0	1	.085	0.77
		b) YES	0	4	47		
8.	Total clinical experience (India or abroad) in years	a) More than 20 (Specify: -----)	0	0	0	0.085	0.77
		b) Between 10-20 (Specify -----)	0	0	1		
		c) Less than 10 years (specify ----)	0	4	47		
9.	Are you oriented to the triage protocol/guideline at AIIMS Bhopal?	a) NO	0	0	0	This value is constant	This value is constant
		b) Yes	0	4	48		

*** : Fisher exact test**

Association Between Sociodemographic Variables and Practice Level

The chi-square analysis revealed that practice levels were not significantly associated with age, gender, designation, specialized course participation, or

clinical experience both outside and within AIIMS Bhopal. However, educational qualification showed a significant association with practice levels ($\chi^2 = 13.20$, $p = 0.02$), indicating that higher academic attainment may enhance clinical proficiency. All participants were oriented to the triage protocol, emphasizing the need for continuous professional development to further improve practice competencies.

Summary: - This chapter summarized the finding of the study. The knowledge assessment revealed that 71.2% possessed a good level of knowledge and 28.8% a satisfactory level, with no one showing poor knowledge; similarly, 92.3% demonstrated good practice, compared to 7.7% with satisfactory practice. Although no significant associations were found between knowledge levels and demographic or professional variables, a significant link between educational qualification and practice levels ($p = 0.02$) was observed, underscoring the need for continuous professional development and targeted training in trauma and emergency care.

CHAPTER-IV

DISCUSSION

This chapter presents the major findings of the study and reviews them in the context of the available evidences.

MAJOR FINDING

1. The majority of participants were male (69.2%), aged 26-30 years (44.2%), and held B.Sc. Nursing degree (75%). Most (98.1%) had trauma and emergency experience at AIIMS Bhopal, with 69.2% trained in BLS.

2. The majority (71.2%) of participants had a good level of knowledge, while 28.8% had a satisfactory level, with none having a poor level. This highlights the need for continuous training to further enhance knowledge levels.

3. The majority (92.3%) of participants demonstrated a good level of practice, while 7.7% had a satisfactory level, with none exhibiting a poor level. This emphasizes the need for ongoing skill development programs to ensure uniform excellence in clinical practice.

4. None of the tested sociodemographic or professional factors showed a statistically significant association with participants' knowledge levels. This highlights the need to explore other factors like motivation, workplace learning culture, and access to continuing education.

5. Educational qualification was significantly associated with practice levels ($p = 0.02$), indicating that higher education enhances clinical proficiency. Other sociodemographic and professional factors showed no significant influence on practice levels.

Discussion: -

The findings of this study align with existing literature regarding the importance of education, training, and experience in trauma triage. Similar to Anderson & Lee (2022) and Johnson & Patel (2024), this study found that triage training plays a crucial role in enhancing knowledge and practice levels among healthcare professionals.[23] Like Foster & King (2018), who emphasized the impact of educational interventions on improving triage accuracy, this study highlighted the significant role of higher education in practice proficiency.[32] Moreover, the high proportion of participants with Basic Life Support (BLS) training aligns with the results of Williams & Taylor (2018), which emphasized the widespread adoption of basic trauma protocols among healthcare providers. However, a key contrast is observed in the association between knowledge and sociodemographic factors.[21] While previous studies, such as Stevens & Hall (2017), found that clinical experience significantly impacts knowledge, this study did not find any statistically significant associations between knowledge levels and age, gender, designation, training, or experience. Furthermore, while Miller & Edwards (2019) identified barriers to effective triage training, including a lack of exposure to real-life trauma scenarios, this study reported that nearly all participants (98.1%) had direct experience in the Trauma and Emergency Medicine Department, suggesting better clinical preparedness.[33] Additionally, Parker & Robinson (2009) highlighted inconsistencies in triage protocol adherence, whereas this study found that all participants were oriented to the AIIMS Bhopal triage protocol, indicating a structured approach to triage training.[29] The findings emphasize the need for continuous skill development programs, as also recommended by Turner & Collins (2020), who highlighted the benefits of simulation-based training in trauma triage performance.[34] While this study suggests that higher educational qualifications significantly impact

practice levels, previous studies like Nguyen & White (2019) and Lopez & Reed (2021) emphasized the role of hands-on experience and workplace culture in enhancing triage decision-making. These similarities and differences indicate that while structured training and education are fundamental to triage competency, other contextual factors such as workplace learning opportunities and simulation-based training should also be explored further.[35]

The findings of this study align with previous research emphasizing the significance of knowledge levels in trauma triage. Similar to Anderson & Lee (2022) and Johnson & Patel (2024), this study found that a majority of participants possessed good knowledge of trauma triage, reinforcing the impact of structured training programs.[23] Foster & King (2018) also highlighted that educational interventions enhance trauma triage accuracy, which aligns with this study's emphasis on continuous training needs.[32] Additionally, Williams & Taylor (2018) and Harris & Green (2023) found that healthcare providers generally have adequate knowledge of emergency protocols, which is consistent with the fact that none of the participants in this study had a poor level of knowledge. However, a key contrast emerges in the relationship between knowledge levels and experience.[21] While Stevens & Hall (2017) and Miller & Edwards (2019) suggested that hands-on clinical exposure significantly influences knowledge retention, this study did not find a direct association between knowledge levels and demographic or professional variables.[31] Furthermore, while Parker & Robinson (2009) reported inconsistencies in triage decision-making due to varying adherence to protocols, this study found that all participants were oriented to the AIIMS Bhopal triage protocol, suggesting a more standardized approach.[29] Unlike Turner & Collins (2020), who emphasized the role of simulation-based training in improving knowledge application, this study did not explicitly assess simulation training's impact.[34] The results suggest

that while overall knowledge levels are strong, continuous professional development remains essential to enhance competency, similar to the recommendations made by Lopez & Reed (2021) and Nguyen & White (2019).[35]

The findings of this study align with previous research emphasizing the high level of competency in trauma triage practice among healthcare professionals. Similar to Anderson & Lee (2022) and Johnson & Patel (2024), this study found that the majority of participants demonstrated a good level of practice, supporting the effectiveness of structured training and clinical experience in improving performance.[23]Additionally, Williams & Taylor (2018) and Harris & Green (2023) reported that trauma care providers generally exhibit strong adherence to triage protocols, which is consistent with the absence of participants scoring at a poor level in this study. However, a notable contrast emerges when considering the impact of training methods.[24] While Turner & Collins (2020) highlighted the role of simulation-based training in enhancing triage performance, this study did not assess simulation's direct influence on practice levels.[34] Moreover, Miller & Edwards (2019) identified barriers such as resource constraints and decision-making challenges affecting trauma triage practice, whereas this study did not report such limitations among participants.[33] Another difference is that Parker & Robinson (2009) noted variability in triage decision-making, while this study suggests a more standardized practice among respondents.[29] Despite these differences, both this study and Lopez & Reed (2021) emphasize the need for continuous professional development, particularly for those with only a satisfactory level of practice, to maintain excellence in trauma triage performance.[35]

This study found no significant associations between participants' knowledge levels and sociodemographic or professional factors, including age, gender, qualifications, designation, attendance in specialized training courses, and clinical experience. This

aligns with findings from Anderson and Lee (2022), who reported that triage training did not significantly enhance knowledge application or practice improvement among emergency department nurses.[23] However, it contrasts with other studies, such as Williams and Taylor (2018), which found that clinical experience influenced trauma providers' knowledge and practices. These discrepancies highlight the need for further research into factors like individual motivation, workplace learning culture, and access to continuing education programs to better understand their impact on trauma triage knowledge.[21]

This study, using the chi-square test to examine the association between participants' practice levels and sociodemographic variables, found no significant relationships with age, gender, designation, specialized courses, or clinical experience. The only exception was educational qualification, which showed a significant association with practice levels. This highlights the importance of academic training in improving clinical practice. These findings align with Anderson and Lee (2022), who found that triage training did not significantly improve practice among emergency department nurses, and similar to your study's lack of significant findings for specialized courses.[23] However, your study contrasts with research by Williams and Taylor (2018), which found that clinical experience plays a role in trauma-informed care practices.[21] Furthermore, while your study emphasizes the role of educational qualification, other studies such as those by Harris and Green (2023) highlight that broader system-based factors, such as effective triage systems, may be more impactful. Overall, your study suggests the need for continued professional development programs, especially in educational qualification, to enhance clinical practice in trauma triage settings.[24]

Limitations:

This study has several limitations. Firstly, the small sample size of 52 healthcare

providers from a single tertiary care hospital (AIIMS Bhopal) limits the generalizability of the findings to other healthcare settings. Additionally, the cross-sectional design captures data at a single point in time, making it difficult to establish causal relationships between factors and trauma triage practices. Furthermore, the study did not account for other potential influences such as personal motivation, attitudes, or institutional learning environments. Lastly, the lack of longitudinal data means that changes in knowledge and practice following training interventions could not be assessed.

Implication:

This study has important implications for trauma care training, policy, and clinical practice. It highlights the effectiveness of current educational programs but also the need for continuous professional development. Refresher courses, simulation-based training, and mentorship programs can help bridge competency gaps. Policymakers should implement periodic assessments to ensure consistent excellence in trauma triage. The findings can guide curriculum enhancements in nursing and emergency medical training. Emphasizing evidence-based triage protocols and decision-making strategies is crucial. Future research should examine factors affecting knowledge variations and assess training impacts on patient outcomes.

Recommendations:

1. **Implementation of Regular Training and Refresher Courses**: Institutions should prioritize regular trauma triage training programs, especially focusing on healthcare providers with lower levels of education or experience. This would ensure that all staff are equipped to perform trauma triage accurately, particularly in emergency or mass casualty situations.
2. **Explore Broader Factors Influencing Triage Practices**: Future research

should explore the influence of additional factors, such as healthcare provider motivation, institutional culture, and peer support, which might impact trauma triage practices beyond formal training and education.

3. **Enhance Interdisciplinary Collaboration**: Encourage collaborative training sessions between nurses, doctors, and other emergency care providers to improve team-based triage decision-making and the implementation of triage protocols.
4. **Longitudinal Studies**: Conduct longitudinal studies to evaluate the long-term impact of trauma triage training programs and their effectiveness in real-world emergency settings, to identify best practices for trauma care.

Conclusion:

This study provides valuable insights into the current knowledge and practice levels of healthcare providers in trauma triage at AIIMS Bhopal, highlighting strengths and areas for improvement. Overall, participants demonstrated good knowledge and practice in trauma triage, with educational qualification identified as a key factor influencing practice proficiency. Despite these strengths, the study identifies gaps that could be addressed through continuous training and professional development, particularly for less experienced healthcare providers. While sociodemographic and professional factors did not significantly correlate with knowledge or practice, the findings underscore the importance of education and ongoing support in improving trauma triage performance. Future research should further explore the complex factors influencing triage practice, focusing on non-traditional elements such as individual motivation and institutional culture, to develop targeted strategies that can improve the quality and consistency of trauma care across healthcare settings.

Summary of the chapter

This chapter includes major findings and discussion in the relation with reviewed literature and implication of the study findings.

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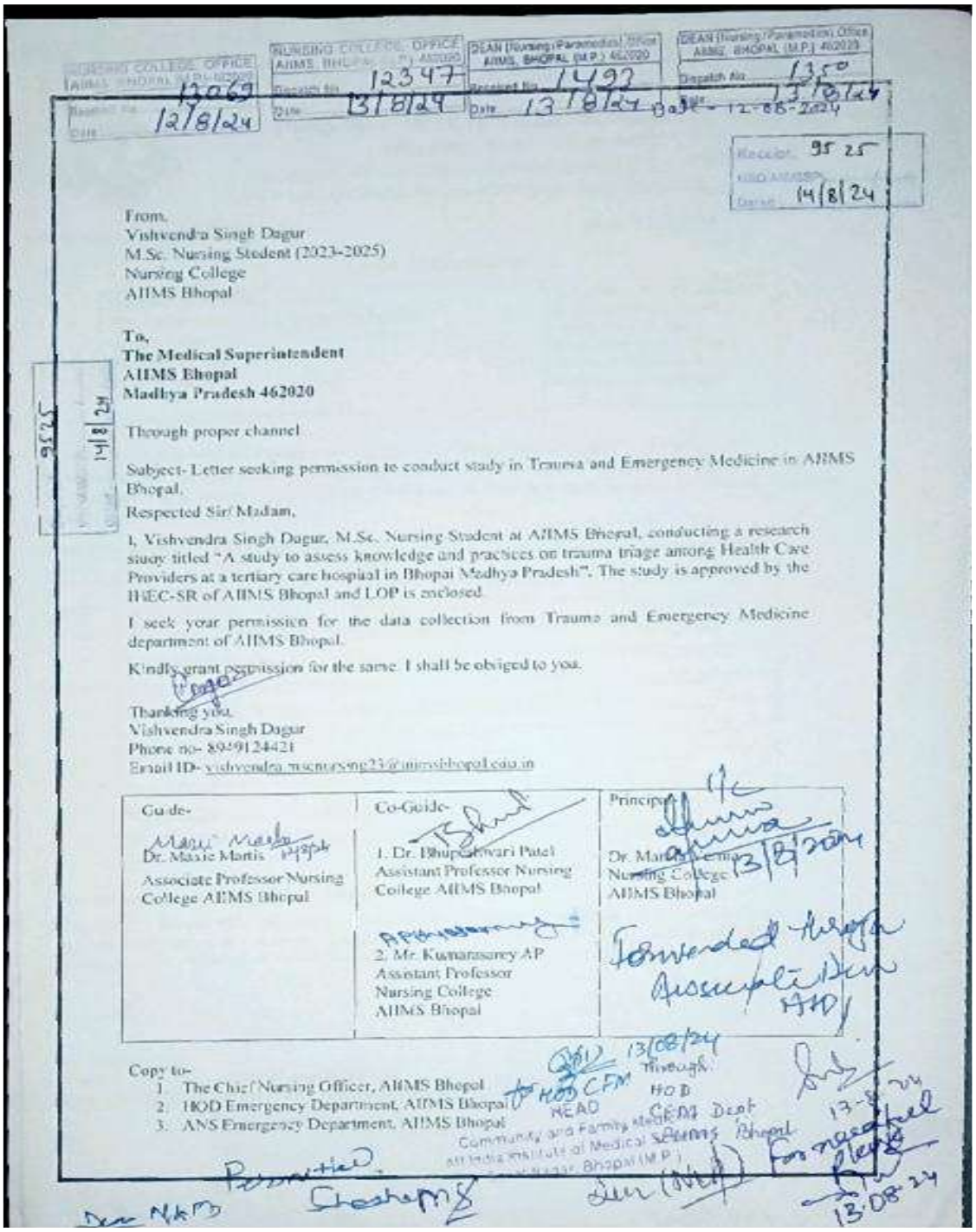
ANNEXURE 1



From,
Vishvendra Singh Dagur
M.Sc. Nursing Student (2023-2025)
Nursing College
AIIMS Bhopal

To,
The Medical Superintendent
AIIMS Bhopal
Madhya Pradesh 462020

Through proper channel

Subject- Letter seeking permission to conduct study in Trauma and Emergency Medicine in AIIMS Bhopal.

Respected Sir/ Madam,

I, Vishvendra Singh Dagur, M.Sc. Nursing Student at AIIMS Bhopal, conducting a research study titled "A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal Madhya Pradesh". The study is approved by the IHEC-SR of AIIMS Bhopal and LOP is enclosed.

I seek your permission for the data collection from Trauma and Emergency Medicine department of AIIMS Bhopal.

Kindly grant permission for the same. I shall be obliged to you.

Thanking you.
Vishvendra Singh Dagur
Phone no- 8959124421
Email ID- vishvendra.msnursing23@aiimsbhopal.edu.in

Guide-	Co-Guide-	Principal
Dr. Maxie Martis Associate Professor Nursing College AIIMS Bhopal	1. Dr. Bhupeshwari Patel Assistant Professor Nursing College AIIMS Bhopal 2. Mr. Kumarasamy AP Assistant Professor Nursing College AIIMS Bhopal	Dr. Marykutty Mathew Nursing College AIIMS Bhopal

Copy to-
1. The Chief Nursing Officer, AIIMS Bhopal
2. HOD Emergency Department, AIIMS Bhopal
3. ANS Emergency Department, AIIMS Bhopal

ANNEXURE 2
TOOL 1: BACKGROUND PROFORMA

Instructions: Encircle the appropriate option or fill the details in the space provided.

S. No.	Sociodemographic Characteristics	Remarks
1	Age (in years)	--------
2	Gender	a) Male b) Female c) Other
3	Qualification	a) General Nursing and Midwifery. b) B.Sc. (Basic) Nursing/B.Sc (Hons) Nursing c) B.Sc (Post. Basic) Nursing d) M.Sc. Nursing (specify the specialty ----------) e) M.B.B.S f) M.D/MS. specify the specialty ----------) g) Others (specify ----------)
4	Designation	a) Nursing officer (NO) b) Senior Nursing officer (SNO) c) Junior Resident (JR) d) Senior Resident (SR) e) Others (specify ------)
5	Have you attended / completed any of following courses?	Encircle all that apply: a) ATLS b) BLS c) ACLS d) PALS e) ATCN (Advanced trauma care for nurses) f) Emergency/disaster nursing g) Others (specify ---)
6	Clinical experience in trauma emergency outside AIIMS Bhopal (India/abroad).	a) No b) Yes (Specify. ---months-----years)
7	Clinical experience in Trauma and Emergency Medicine department at AIIMS Bhopal.	a) No b) Yes (Specify. ---months-----years)
8.	Total clinical experience (India or abroad) in years	a) More than 20 (Specify: -----) b) Between 10-20 (Specify -----) c) Less than 10 years (specify ----)
9.	Are you oriented to the triage protocol/guideline at AIIMS Bhopal?	a) No b) Yes

TOOL 2: KNOWLEDGE QUESTIONNARIE

Specification table

Sl No	Domain	No. of the MCQ item		
		Recall	**Comprehension**	**Application**
1	Triage concept	1	16, 17	
2	Assessment	2	6, 15, 19, 5	10, 13
3	Decision making		3, 7, 8	12
4	Interventions		20	4, 9, 11, 14

1 ABCDE in triage protocol refers to:

A. Airway, Breathing, Circulation, Disability, Exposure
B. Appearance, Breathing, Consciousness, Disability, Exposure
C. Assessment, Breathing, Circulation, Disability, Exposure
D. AVPU, Breathing, Consciousness, Disability, Exposure

2. As per the triage protocol at AIIMS Bhopal, when a patient presents to the emergency room, which of the following assessment is the first to be noted, by the health care provider?

A. Noisy breathing
B. Presence or absence of pulse
C. Presence or absence of C- spine injury
D. Response to pain

3. Which of the following observations of adult patients, presenting self to triage, with history of abrasions and lacerations on limbs and the scalp, and no past history of any illness, would be assigned a triage category "GREEN"?

A. Respiratory rate of 12 and SpO_2 of 94%
B. Respiratory rate of 18 and SpO_2 of 98%
C. Respiratory rate of 22 and SpO_2 of 89%
D. Respiratory rate of 30 and SpO_2 of 91%

4. A 26-year-old five months pregnant is brought to emergency triage at 1PM by an EMT from the location of car crash 20 kms away. Patient is conscious, no complaints and EMT reports co-passengers died on the spot. The decision by the health provider at the triage should be:

A. Assign triage category – Green and transfer patient to OBG OPD
B. Assign triage category – Red and register patient in Emergency
C. Assign triage category –Yellow and transfer patient to Labour Room
D. Do not register patient and discharge patient from triage

5. Which of the following adult patient's observations would be assigned a red triage category?

A. A closed chest wound and the respiratory rate is 18/minute.
B. Alert and has a small laceration on the scalp requiring stitches.
C. Injured head and neck with slow, irregular respirations
D. A dislocated right shoulder with pain score of but can walk, talk.

Answer MCQ 6 to 10 with reference to scenario 1.

Scenario 1: An adult male involved in a car accident 30 minutes ago, brought to the emergency room by a bystander. Patient is incoherent, pale, and diaphoretic. His temperature is 97°F, blood pressure is 80/40 mm/Hg, heart rate is 122 beats/minute, respiratory rate is 28 breaths/minute and capillary refill time is 3 seconds. Bystander informs that the patient was a passenger of his four seater taxi, was in the back seat, and was found lying between seats when sudden break was applied, to avert a speeding truck.

6. The sign and symptoms of patient are suggestive of:

A. Cardiogenic shock
B. Hypovolemic shock
C. Neurogenic shock
D. Septic shock

7 The triage category to be assigned is:

A. BLACK
B. GREEN
C. RED
D. YELLOW

8. The time within which the patient should be seen in Emergency room would be:

A. Immediately
B. With-in 10 minutes
C. With-in 30 minutes
D. With-in 60 minutes

9. The health care providers must initiate following interventions on priority <u>except</u>:

A. Apply C- Collar on patient and advice bystander to register patient
B. Inform the police and public relation officer before patient registration
C. Start a large bore IV, collect specimens for blood test and start LR
D. Start Oxygen 6L/min by face mask, and apply monitor leads

10. Upon reassessment after 10 minutes, patient is fully conscious, SBP is 90/60mmHg, Respirations are 24/min, SpO_2 is 96%, and the urine is clear. Which of the following decisions of the health care provider is considered appropriate?

A. The triage category assigned at this time will remain the same
B. History of mechanism of injury from patient is not required
C. Enquire past history of medical, medication, meal and allergies
D. Insert an indwelling catheter and monitor urine output

11. An adolescent presents to the emergency department after being struck in the head with a cricket bat. He complains of headaches and pain in the deltoid region. The <u>first</u> action to be performed by health care provider at the triage is:

A. Apply C-spine immobilization

B. Apply ice to the deltoid region
C. Obtain a full set of vital signs.
D. Suction nose and oropharynx

12. The following four-patients arrived at emergency triage at the same time. Which of the following patients should be attended first in the emergency room?
A. A 40-year-old with history of fever and a temperature of 102^0 F
B. A 25-year-old with Sucking chest wound with breathing difficulty
C. A 30-year-old with severe chest pain on coughing.
D. A 13-year-old with swollen, painful left thumb

13. An adult female brought to the emergency department with history of gunshot wound to the abdomen. The following questions are most appropriate to determine possible injuries except:
A. In which direction did the bullet enter the body?
C. Were you wearing any protective device on abdomen?
D. What was distance between you and the shooter?
D. Why did the gun shot injury occur?

14. A 17 year old female arrives in the emergency room, complaining severe burning pain in the left eye. She reports that a concentrated chemical was splashed on her face. Which of the following actions by the health care provider at triage is appropriate?
A. Examine the client's visual acuity first
B. Patch the right eye and advice to close the left eye
C. Instill normal saline drops to the left eye and patch the left eye
D. Let patient lie flat and flush the left eye with water/saline for 10 minutes

15. For a patient presenting with inhalation injury, which of the following assessment is guides treatment decision?
A. Apical pulse
B. Body temperature
C. Lung sounds
D. Oxygen saturation

16. Which of the following is TRUE about trauma triage?
A. AVPU scale is used to assess consciousness in tertiary care settings
B. In case of trauma, the approach is HABCDE instead of ABCDE
C. Place patient in recovery position irrespective of the type of trauma
D. Use jaw thrust method to open airway when patient has no head & neck injury

17. Which of the following is TRUE about field triage?
A. A triage done carefully at the scene to ensure resources available match victims' needs
B. Deploying rescue team to assess scene safety at the location of an disaster
C. Over triage means non critical patients are sent to facilities offering primary care
D. Under triage means critically injured are sent to facilities offering highest level of care

18. Which of the following children does not require an admission in the burns unit?

A. Any burn involving face, hands, feet, perineum
B. Burns associated with inhalational or other injuries
C. Electrical/chemical or circumferential burns
D. Total body surface area with superficial burns is <5%

Answer MCQ 19-20 in relation to scenario 2

Scenario 2: A eight year male child was brought by the mother to the ER, with history of fall from the stairs of about 5 metres. The child is unresponsive. No obvious external injuries are noted during triage.

19. To assess GCS, health care provider must use:
    A. GCS for adult
    B. Any one: Pediatric or adult GCS
    C. GCS for Pediatric
    D. Both adult and pediatric

20. The following measures are appropriate for airway management except:
    A. Apply C- collar and use head tilt chin lift maneuver
    B. Do not hyperextend the neck
    C. Manual in line stabilization of head and neck
    D. Use a jaw thrust or chin lift maneuver

KNOWLEDGE QUESTIONNAIR
ANSWER KEY

Question	1	2	3	4	5	6	7	8	9	10
Answer	**A**	**A**	**B**	**B**	**C**	**B**	**C**	**A**	**B**	**C**
Question	11	12	13	14	15	16	17	18	19	20
Answer	**A**	**B**	**D**	**D**	**C**	**B**	**A**	**D**	**A**	**A**

Scoring: Each correct response to a MCQ is scored as one. Maximum score will be 20. Unanswered or incorrect response will be scored as zero

Interpretation of scores:

1. Good: if scores are >75%
2. Satisfactory: if scores are between 50 to 74%
3. Poor: if scores are less than 50%

TOOL 3: OBSERVATION CHECKLIST TO ASSESS TRIAGE PRACTICE

Instruction: The observer places Y for Yes; N for No

S.N.	ACTIVITY	Yes	No
1.	Patient name & details mentioned		
2.	Date & Time of triage mentioned		
3.	FAST TRACK mentioned		
4.	Respiratory rate: manually/monitoring device		
5.	Pulse: manually for presence		
6.	Pulse rate: manually/monitoring device		
7.	BP: using monitoring device		
8.	$SpO_{2:\ using}$ monitoring device		
9.	GCS/AVPU: Using the respective scale		
10.	History and mechanism are mentioned or not		
11.	Triage categorization is done or not as per triage protocol (injuries identified / mechanism of Injury)		
	Red		
	Yellow		
	Green		
12.	Triage doctor/nurse name and sign is mentioned or not		

Scoring: Each correct practice is scored as one. Maximum score will be 12. Unanswered or incorrect practice will be scored as zero

Interpretation of scores:

4. Good: if scores are 09 to 12
5. Satisfactory: if scores are between 5 to 08
6. Poor: if scores are less than < 5

ANNEXURE 3

Sr. No.	Name of expert	Designation and Institute
1.	Dr. Mohd Yunus	Professor and Head , Trauma & Emergency Department, AIIMS Bhopal
2.	Dr. Pankaj Goel	Professor and Head , Dentistry, AIIMS Bhopal
3.	Dr. Amit Priyadarshi	Assistant Professor , Trauma & Emergency Department, AIIMS Bhopal
4.	Dr. B L Soni	Assistant Professor , Trauma & Emergency Department, AIIMS Bhopal
5.	Dr. Amit Agrawal	Professor and Head , Neurosurgery, AIIMS Bhopal
6.	Dr. Mahadev Meena	Assistant Professor , General Medicine, AIIMS Bhopal
7.	Dr. Vijendra Singh	Additional Professor, Dept. of Psychiatry, AIIMS Bhopal
8.	Mr. R Velmurugan	Assistant Professor , Medical Surgical Nursing, AIIMS Bhopal
9.	Mr. Rahul S R	Assistant Nursing Superintendent , Nursing Services, AIIMS Bhopal
10.	Mr. Sarvesh Kaushlam Dhakar	Assistant Nursing Superintendent , Nursing Services, AIIMS Bhopal
11.	Dr. Shweta Patel	Associate Professor , Obstetrics & Gynaecology, AIIMS Bhopal

ANNEXURE 4

NURSING COLLEGE, OFFICE
AIIMS, BHOPAL (M.P)-462020
Received No. 1237
Date 26/2/24

LETTER REQUESTING EXPERT'S OPINION AND SUGGESTIONS FOR THE CONTENT VALIDITY OF TOOLS

From,

Vishvendra Singh Dagur

M.Sc. in Community Health Nursing,

Nursing College

AIIMS Bhopal

To,

_____
_____
_____

Subject: Requesting content validity of research tools.

Respected Sir/ Madam,

I, Vishvendra Singh Dagur have selected a topic for a research titled "A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh." to be submitted as a partial fulfillment of M.Sc. Nursing in Community Health Nursing course.

I have prepared the following tools for data collection.
a) Background proforma.
b) Knowledge questionnaire on triage
c) Observation checklist to assess the practice of triage
d) Triage form/Documentation sheet

Criteria checklist for content validation, and certificate of validation are enclosed along with the tools. I, kindly request you to go through the tools and give your valuable suggestions. Your input will be highly appreciated. Kindly sign the certificate of validation.

Thanking you

Yours Sincerely

Vishvendra Singh Dagur
M.sc in Community Health Nursing
Nursing College, AIIMS Bhopal

Guide:
Dr. Maxie Martis
Associate Professor
Nursing College
AIIMS Bhopal

Co-Guide:
Mr. Kumarasamy AP
Assistant Professor
Nursing College
AIIMS Bhopal

Co-Guide:
Dr. Bhupeshwari Patel
Assistant Professor
rauma & Emergency and
Medicine Department
AIIMS Bhopal

Forwarded by:
Dr. Mamta Verma
Principal I/C
Nursing College
AIIMS Bhopal

Encl: Triage protocol at AIIMS Bhopal

ANNEXURE 5

Tools 1- BACKGROUND PROFORMA It consists of total 09 items. We need your expert judgement on degree of relevancy of each item. If there is any suggestions (for deletion/modification), please mention in the remark's column. Your expert opinion and kind cooperation will be appreciated.					
Item no.	**Highly relevant 4**	**Quite Relevant 3**	**Somewhatrelevant 2**	**Not relevant 1**	**Remarks**
Item no. 1					
Item no. 2					
Item no. 3					
Item no. 4					
Item no. 5					
Item no. 6					
Item no. 7					
Item no. 8					
Item no. 9					

Name of the validator Signature: Date:

Suggestions if Any:

Tools 2: Knowledge Questionnaire on triage:

It consists of a total 20 MCQ items. We need your expert judgementon degree of relevancy of each question. If there are any suggestions and modification, please mention in the remark's column. Your expert opinion and kind cooperation will be highly appreciated.

Item no.	Highly relevant 4	Quite Relevant 3	Some what relevant 2	Not relevant 1	Remarks
Item no. 1					
Item no. 2					
Item no. 3					
Item no. 4					
Item no. 5					
Item no. 6					
Item no. 7					
Item no. 8					
Item no. 9					
Item no. 10					
Item no. 11					
Item no. 12					
Item no. 13					
Item no. 14					
Item no. 15					
Item no. 16					
Item no. 17					
Item no. 18					
Item no. 19					

Item no. 20					

Name of the validator Signature: Date:

Suggestions if any:

Tools 3: OBSERVATION CHECKLIST TO ASSESS TRIAGE PRACTICE:

It consists of a total 12 activity items, each with sub items with three areas of assessment namely use of relevant technique, method and accuracy of documentation. We need your expert judgment on the degree of relevancy of each item and sub item as well as areas of assessment. If there are any suggestions and modification, please mention in the remark's column. Your expert opinion and kind cooperation will be appreciated.

Item no.	Highly relevant 4	Quite Relevant 3	Some what relevant 2	Not relevant 1	Remarks
Activity					
Item no. 1					
Item no. 2					
Item no. 3					
Item no. 4					
Item no. 5					
Item no. 6					
Item no. 7					
Item no. 8					
Item no. 9					
Item no. 10					
Item no. 11					
Item no. 12					

Name of the validator Signature: Date:

Suggestions if any:

ANNEXURE 6

CERTIFICATE OF VALIDATION

This is to certify that the tool constructed by, Vishvendra Singh Dagur, M.sc Nursing student, Nursing College, AIIMS Bhopal, to be used in his study titled "A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh" has been validated by me and is found to be **valid/ not valid.**

Overall remark: very well designed triage assessment tool. A Column of Re triaging can be added, as it is a dynamic process.

Signature:

Name of the expert: DR. AMIT PRIYADARSHI

Designation: ASSISTANT PROFESSOR (TEM.)

Name of the institution: AIIMS BHOPAL

Official seal:

Dr. AMIT PRIYADARSHI
M.Ch. Trauma Surgery & Critical Care
Assistant Professor
Dept. of Trauma & Emergency Medicine
AIIMS, Saket Nagar, Bhopal-462020

Date: 15/3/24. Place: Bhopal

ANNEXURE 7

Participant Information Sheet

1.STUDY TITLE:

"A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh."

1. STUDY INVESTIGATORS:

A. Student: Vishvendra Singh Dagur, M.Sc. nursing first year, AIIMS Bhopal.

B. Guide: Dr. Maxie Martis, Associate Professor, Nursing College, AIIMS Bhopal.

C. Co- Guide: Mr. Kumarasamy AP, Assistant Professor, Nursing College AIIMS Bhopal.

D. **Co-Guide: Dr Bhupeshawari, Associate Professor, Trauma E.M. AIIMS Bhopal**

2. Introduction:

We are conducting research "A study to assess knowledge and practices on trauma triage among Health Care Providers at a tertiary care hospital in Bhopal, Madhya Pradesh.". We would like to say that please give your consent, so that we can complete our study. If you agree to take part voluntarily, we will ask you to sign a consent form.

3. Purpose of the study:

The aim of our study is to study to assess knowledge and practices on trauma triage among Health Care Provider (Residents, Nursing officers and Senior Nursing Officers) at tertiary care hospital in Bhopal, Madhya Pradesh.". This will help us to find relationship between knowledge and practice of Nursing officer of trauma emergency and it will also help in find the association of practice with Sociodemographic variables.

4. Taking part – what it involves:

A. Do I have to take part?

Participation in this research is entirely voluntary. A decision to not take part, or to withdraw at any time, will not affect your rights or medical care in any way.

B. What is expected of me if I take part?

If you agree to participate in the study, after taking informed consent, some questions will be asked to you regarding knowledge and practice to be followed in trauma emergency.

C. How long will my part in the study last?

Your participation in the study would last for 15-20 minutes. For this you don't have to come separately and repeatedly.

D. What are the possible benefits in taking part?

Taking part will help to assess knowledge and practice among nursing officer in

trauma emergency.

E. What are the possible disadvantages and risks of taking part?

There are no any specific risks/adverse effects associated with my study.

F. What happens to the information collected from me?

All information collected will be kept strictly confidential and not shared with anyone. Results from the study will be reported as group data and will not identify you in any way.

G. What if I change my mind regarding participation in the study?

You are entitled to change your mind and withdraw at any time during the study without any disadvantage or penalty.

H. Whom do I contact for more information or if I have further questions or concerns?

If you want any information or have questions or concerns, you can contact:

Student: - Vishvendra Singh Dagur Postgraduate student Department of CHN AIIMS Bhopal 8949124421	Dr. Ankur Joshi Member Secretary, Institute Ethics Committee – Students AIIMS Bhopal Phone no. 8818899050, ihecpgr@aiimsbhopal.edu.in)

Guide:
Dr. Anurag Bhai Patidar
Associate Professor
Nursing College,
AIIMS Bhopal

Date: 12-01-2024

ANNEXURE 8

प्रतिभागी सूचना सहमति प्रपत्र

[PARTICIPANT INFORMED CONSENT FORM (PICF)]

इस अध्ययन के लिए प्रतिभागी का पहचान नंबरः …….....

Participant Identification Number for this Study: ……..

अनुसंधान का शीर्षकः ....

अध्ययन शीर्षक:

"भोपाल, मध्य प्रदेश में तृतीयक देखभाल अस्पताल में स्वास्थ्य देखभाल प्रदाता के बीच ट्रॉमा ट्राइएज पर ज्ञान और अभ्यास का आकलन करने के लिए एक अध्ययन।

शोधकर्ता छात्र का नाम . विश्वेंद्र सिंह डागुर फोन नं: 8949124421

Name of Student Investigator: Vishvendra singh Dagur. Tel No.(s): 8949124421

शोध मार्गदर्शक का नाम : ……..…… ……....

Name of Thesis Guide:

1. Guide: Dr. Maxie Martis, Associate Professor, Nursing Coll,ege, AIIMS Bhopal.

2. Co-Guide: Mr. Kamarasamy AP, Assistant Professor, Nursing College, AIIMS Bhopal.

3.Co-Guide: Dr Bhupeshawari, Associate Professor, Trauma E.M. AIIMS Bhopal.

मैंने दिनांक 12.01.2024 के सूचना पत्रक संस्करण II में दिए गए सभी तथ्यों को सावधानीपूर्वक पढ़ लिया है/ मुझे अपनी भाषा में स्पष्ट रूप से विस्तारपूर्वक समझा दिया गया है, और मैंने तथ्यों को पूर्णतः समझ लिया है। मैं पुष्टि करता/ करती हूँ, कि मुझे सवाल पूछने के अवसर प्रदान किए गए।

The contents of the information sheet version II dated 12 January 2024 that was provided have been read carefully by me / explained in detail to me, in a language that I comprehend, and I have fully understood the contents. I confirm that I have had the opportunity to ask questions.

मुझे इस अध्ययन की प्रकृति एवं उद्देश्य और इसके संभावित जोखिमों / लाभों तथा अध्ययन की अनुमानित अवधि एवं अन्य प्रासंगिक जानकारी के बारे में विस्तारपूर्वक समझा दिया गया है। मुझे पता है कि इस अध्ययन में मेरी भागीदारी स्वैच्छिक है तथा मैं इस अध्ययन से किसी भी समय बिना कोई कारण

बताए, अपना नाम वापस लेने के लिए स्वतंत्र हूं और नाम वापस लेने पर मेरी चिकित्सा देखभाल या कानूनी अधिकारों पर कोई प्रभाव नहीं पड़ेगा।

The nature and purpose of the study and its potential risks/benefits and expected duration of the study, and other relevant details of the study have been explained to me in detail. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal right being affected.

मैं समझता/समझती हूं कि इस अनुसंधान में मेरी भागीदारी से मेरे बारे में एकत्र की गई जानकारी और मेरे चिकित्सीय दस्तावेजों के किसी भी भाग को एम्स के जिम्मेदार व्यक्तियों द्वारा ही देखा जाएगा। मैं इन व्यक्तियों को मेरे रिकॉर्ड प्राप्त करने की अनुमति प्रदान करता/ करती हूँ।

I understand that the information collected about me from my participation in this research and sections of any of my medical notes may be looked at by responsible individuals from AIIMS. I give permission for this individual to have access to my records.

यदि प्रतिभागी बच्चा है तो उसकी मौखिक या लिखित सहमति प्राप्त की गई है।

If participants is child, his/her verbal of written assent has been obtained.

मैं उक्त अध्ययन में भाग लेने के लिए सहमत हूं/

I agree to take part in the above study._____

(प्रतिभागी के हस्ताक्षर / बांए अंगूठे का निशान) (Signature/Left Thumb Impression

दिनांक/Date……स्थान/Place …….....

प्रतिभागी का नाम/Name of the participant…….....

पिता/पति/पत्नी का नाम /Son/Daughter/Spouse of……

डाक का पूरा पता /Complete Postal Address ……..

अगर अशिक्षित हों / If illiterate.

सूचना पत्र को प्रतिभागी को पढ़ा और समझाया गया है और प्रश्न पूछने का अवसर दिया गया है। मैं पुष्टि करता हूं कि व्यक्ति ने स्वतंत्र रूप से अपनी सहमति दी है ।

The information sheet has been read and explained to the participant and given the opportunity to ask questions. I confirm that the individual has given consent freely.

कानूनी रूप से स्वीकार्य प्रतिनिधि या निष्पक्ष गवाह के हस्ताक्षर

Signature of Legally acceptable representative or impartial witness.

दिनांक/Date

एलएआर या निष्पक्ष गवाह का नाम / Name of LAR or impartial witness .

पता / Address :-

प्रमाणित किया जाता है कि उक्त सहमति मेरी उपस्थिति में प्राप्त की गई ।

This is to certify that the above consent has been obtained in my presence.

_____

छात्र शोधकर्ता के हस्ताक्षर दिनांक…….

स्थान……

Signature of the student Investigator Date

……Place ……

कृपया ध्यान देः सहमति प्रपत्र तीन प्रतियों में (1) प्रतिभागी के लिए, (2) शोधकर्ता, (3) संस्थान के लिए तैयार करें ।

(छात्रों से अनुरोध है कि आसानी से समझ आने योग्य हिंदी अनुवाद स्वयं तैयार करें)

NB: Three copies should me made, for (1) Participants, (2) Researcher, (3) Institution

(Students are requested to prepare the translation in simple understandable Hindi on their own language)

ANNEXURE 9

All India Institute of Medical Sciences, Bhopal

TRAUMA AND EMERGENCY MEDICINE DEPARTMENT - TRIAGE FORM

Name: ..... **AVPU/GCS:**..... **Date & Time of Triage:**.....

Age / Sex: ..... **BP:** ...../.....mm of Hg, PR: ...../min, RR: ...../min, SPO_2: .....%,

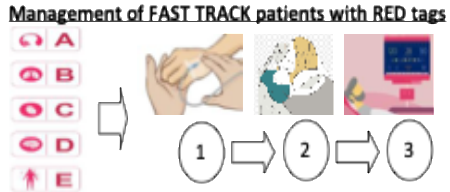
FAST TRACK ☐ UNCONSCIOUS ☐ CHEST PAIN ACS ☐ STROKE (FAST)

RED

Physiological

- ☐ **A:** Noisy breathing
- ☐ **B:** RR<10 or >24/min
  SPO_2 <95%
- ☐ **C:** .Radial Pulse - Present / Absent
  .Pulse<50 or >100/min
  .SBP <90 mm Hg
  .Capillary refill >2 sec
- ☐ **D:** .Responding only to pain on AVPU-Scale of GCS ≥ 12
  .C-Spine Injury with Single Breath count ≥ 15

Management of FAST TRACK patients with RED tags



If vitals are stable, then evaluate further for YELLOW / GREEN

	NON - TRAUMA	TRAUMA	
		Injuries identified	**Mechanism of injury**
RED	☐ **Breathlessness** / Pallor with Edema ☐ **Active Bleeding** (Hematemesis, Hemoptysis, Epistaxis, Hematuria etc) ☐ **Active seizures** ☐ H/o Fainting / Syncope ☐ **Fever with Delirium** ☐ Poisoning with unstable vital sign ☐ Snake / Scorpion bite ☐ Burn >20% BSA (Burn of special areas) ☐ Hanging /Drowning / Electrocution / Heat Stroke	☐ Gun-shot wound ☐ Major Vascular injury ☐ Stab wounds (Head/Neck/Chest/Abdomen/Groin) ☐ Multiple injuries ☐ Open fractures excluding fractures of hand and feet ☐ Two or more long bone fracture ☐ Pelvic fracture ☐ Visible neck swelling ☐ Suspected sexual assault ☐ Flail chest with paradoxical respiration ☐ Chest trauma with • Surgical Emphysema • Seat Belt Mark • CCT Positive ☐ Traumatic Amputation	☐ Fall from • >3 times height of patient • >5 stairs ☐ Roll over vehicle ☐ Stuck between 2 heavy vehicles ☐ Ejection from vehicle ☐ Railway track injuries ☐ Co-passenger death ☐ Steering wheel injury ☐ Prolonged extrication from vehicle
YELLOW	☐ Post-seizure stage ☐ Pain abdomen / Loose motions (>3episodes) ☐ Painful Bleeding P/R ☐ H/o Bleeding ☐ Pallor/ Known Anaemia for Transfusion ☐ Fever with Headache/ chest Pain / Jaundice ☐ Fever in patient on chemotherapy / HIV Patients / Diabetic patients ☐ Drug overdose, Poisoning with stable vital signs ☐ Painful swelling / wound ☐ Headache, dizziness ☐ Unable to pass stool Unable to pass urine	☐ Minor Head Injury ☐ Open or closed fractures of hand & feet ☐ Isolated long bone fracture ☐ GCS-15 with • Alcohol • Anticoagulant • LOC and vomiting • Nasal & ENT bleed ☐ Limb Weakness	☐ Fall from • <3 times height of patient • <5 stairs ☐ Suspected child abuse ☐ Suspected elderly abuse ☐ Significant assault
GREEN	☐ Minor symptoms of existing illness ☐ Fitness urticaria / Skin rash ☐ Fever ☐ For medico-legal examination Minor conditions and low risk conditions (cough, cold, etc.)	☐ Abrasions ☐ Lacerations ☐ Isolated fracture of small bones of hand and foot Contusions and Bruises	

Name of the Triage Doctor ..... **Signature** .....

Name of the Triage Nurse..... **Signature** .....

Master sheet of socio demographic variable

Code No.	D1	D2	D3	D4	D5	D6	D7	D8	D9	KT
P1	3	1	4	2	2	1	2	3	2	13
P2	3	1	2	2	2	1	2	3	2	17
P3	2	2	2	1	2	1	2	3	2	18
P4	3	1	2	1	2	1	2	3	2	15
P5	1	1	2	1	2	1	1	3	2	15
P6	1	2	2	1	2	1	2	3	2	13
P7	2	1	2	2	2	1	2	3	2	16
P8	2	1	2	1	3	1	2	3	2	17
P9	3	1	2	1	3	2	2	3	2	12
P10	2	2	2	1	3	1	2	3	2	13
P11	3	1	2	2	2	2	2	3	2	17
P12	2	2	2	1	2	1	2	3	2	12
P13	4	1	2	1	3	2	2	2	2	16
P14	3	1	2	1	2	2	2	3	2	16
P15	2	1	2	1	2	2	2	3	2	16
P16	1	2	2	1	4	1	2	3	2	16
P17	3	1	2	2	2	2	2	3	2	14
P18	2	2	1	1	2	2	2	3	2	16
P19	4	1	2	1	4	2	2	3	2	18
P20	3	1	2	1	2	2	2	3	2	16
P21	1	2	2	1	3	1	2	3	2	14
P22	2	1	1	1	2	2	2	3	2	13
P23	1	2	2	1	4	1	2	3	2	15
P24	1	2	2	1	1	1	2	3	2	17

P25	2	1	2	2	2	1	2	3	2	19
P26	3	1	2	2	3	1	2	3	2	18
P27	2	2	3	1	2	1	2	3	2	16
P28	3	1	2	1	2	1	2	3	2	15
P29	2	2	2	1	2	1	2	3	2	16
P30	2	1	2	2	2	1	2	3	2	17
P31	1	1	2	1	2	1	2	3	2	18
P32	2	1	2	2	2	1	2	3	2	19
P33	2	1	2	1	2	1	2	3	2	17
P34	2	1	2	1	2	2	2	3	2	16
P35	2	1	2	2	2	2	2	3	2	17
P36	3	1	2	1	3	2	2	3	2	18
P37	2	2	2	1	2	2	2	3	2	11
P38	1	2	2	1	2	1	2	3	2	16
P39	2	1	2	1	3	1	2	3	2	14
P40	2	2	2	1	4	1	2	3	2	17
P41	3	1	4	1	2	1	2	3	2	17
P42	3	1	2	1	2	1	2	3	2	17
P43	1	1	2	1	2	1	2	3	2	14
P44	3	1	2	1	3	2	2	3	2	16
P45	2	2	7	4	2	1	2	3	2	19
P46	3	1	5	3	3	1	2	3	2	17
P47	2	1	5	3	2	1	2	3	2	16
P48	2	1	5	3	2	2	2	3	2	19
P49	1	1	5	3	4	1	2	3	2	18
P50	3	1	5	3	2	2	2	3	2	16
P51	2	1	5	3	2	1	2	3	2	16
P52	1	2	5	3	2	1	2	3	2	18

Master sheet of knowledge

Code No.	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16	K17	K18	K19	K20	Total
P1	1	0	1	0	1	1	1	1	1	1	0	1	1	0	0	1	0	1	0	1	13
P2	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	17
P3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	18
P4	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0	1	1	1	15
P5	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	15
P6	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	0	1	0	0	13
P7	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	16
P8	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	17
P9	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	0	0	12
P10	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	0	0	13
P11	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	17
P12	1	1	1	1	1	1	1	1	0	0	0	1	1	0	0	1	0	1	0	0	12
P13	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	16
P14	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	16
P15	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0	16
P16	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	16
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P18	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0	16
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P20	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	0	16
P21	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	0	0	14
P22	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	1	0	1	0	1	13
P23	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	15
P24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	17
P25	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	19

P26	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	18
P27	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	16
P28	1	0	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	15
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P31	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	18
P32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
P33	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	17
P34	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	16
P35	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	17
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P37	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	0	1	0	0	11
P38	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	16
P39	1	0	1	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	14
P40	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	17
P41	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	17
P42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	17
P43	1	1	1	1	1	1	1	0	1	1	0	1	0	0	0	1	1	1	0	1	14
P44	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	16
P45	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
P46	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	17
P47	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	16
P48	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	19
P49	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	18
P50	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	16
P51	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	16
P52	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	18

Master sheet of socio demographic variable with knowledge

Code No.	D1	D2	D3	D4	D5	D6	D7	D8	D9	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	K13	K14	K15	K16	K17	K18	K19	K20	Total
P1	3	1	4	2	2	1	2	3	2	1	0	1	0	1	1	1	1	1	1	0	1	1	0	0	1	0	1	0	1	13
P2	3	1	2	2	2	1	2	3	2	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	17
P3	2	2	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	18
P4	3	1	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0	1	1	1	15
P5	1	1	2	1	2	1	1	3	2	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	0	0	15
P6	1	2	2	1	2	1	2	3	2	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	0	1	0	0	13
P7	2	1	2	2	2	1	2	3	2	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	16
P8	2	1	2	1	3	1	2	3	2	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	17
P9	3	1	2	1	3	2	2	3	2	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	1	0	0	12
P10	2	2	2	1	3	1	2	3	2	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	0	0	13
P11	3	1	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	17
P12	2	2	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	0	0	0	1	1	0	0	1	0	1	0	0	12
P13	4	1	2	1	3	2	2	2	2	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	16
P14	3	1	2	1	2	2	2	3	2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	16
P15	2	1	2	1	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0	16
P16	1	2	2	1	4	1	2	3	2	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	16
P17	3	1	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1	0	14
P18	2	2	1	1	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	0	0	16
P19	4	1	2	1	4	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	18
P20	3	1	2	1	2	2	2	3	2	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	0	16
P21	1	2	2	1	3	1	2	3	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	0	0	14
P22	2	1	1	1	2	2	2	3	2	1	1	1	1	1	1	1	0	1	0	1	1	0	0	0	1	0	1	0	1	13
P23	1	2	2	1	4	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	0	15

P24	1	2	2	1	1	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	17
P25	2	1	2	2	2	1	2	3	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	19
P26	3	1	2	2	3	1	2	3	2	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	18
P27	2	2	3	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	16
P28	3	1	2	1	2	1	2	3	2	1	0	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	15
P29	2	2	2	1	2	1	2	3	2	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	16
P30	2	1	2	2	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	17
P31	1	1	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	18
P32	2	1	2	2	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
P33	2	1	2	1	2	1	2	3	2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	17
P34	2	1	2	1	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	16
P35	2	1	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	17
P36	3	1	2	1	3	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	18
P37	2	2	2	1	2	2	2	3	2	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	0	1	0	0	11
P38	1	2	2	1	2	1	2	3	2	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	16
P39	2	1	2	1	3	1	2	3	2	1	0	1	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	14
P40	2	2	2	1	4	1	2	3	2	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	17
P41	3	1	4	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	17
P42	3	1	2	1	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	17
P43	1	1	2	1	2	1	2	3	2	1	1	1	1	1	1	1	0	1	1	0	1	0	0	0	1	1	1	0	1	14
P44	3	1	2	1	3	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	16
P45	2	2	7	4	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	19
P46	3	1	5	3	3	1	2	3	2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	17
P47	2	1	5	3	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	16
P48	2	1	5	3	2	2	2	3	2	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	19
P49	1	1	5	3	4	1	2	3	2	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	18
P50	3	1	5	3	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	0	1	16
P51	2	1	5	3	2	1	2	3	2	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	16
P52	1	2	5	3	2	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	18

Master sheet of Practice

Code No.	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	TOTAL
P1	1	1	1	1	1	1	1	1	1	1	1	1	12
P2	1	1	1	1	1	1	1	1	1	1	1	1	12
P3	1	1	1	1	1	1	1	1	1	1	1	1	12
P4	1	1	0	1	1	1	1	1	1	0	1	0	9
P5	1	1	0	1	1	1	1	1	1	0	1	1	10
P6	1	1	0	1	1	1	1	1	1	1	1	0	10
P7	1	1	1	1	1	1	1	1	1	1	1	1	12
P8	1	1	1	1	1	1	1	1	1	1	1	1	12
P9	1	1	1	1	1	1	1	1	1	1	1	1	12
P10	1	1	1	1	1	1	1	1	1	1	1	1	12
P11	1	1	1	1	1	1	1	1	1	1	1	1	12
P12	1	1	1	1	1	1	1	1	1	1	1	1	12
P13	1	1	1	1	1	1	1	1	1	1	1	1	12
P14	1	1	1	1	1	1	1	1	1	1	1	1	12
P15	1	1	1	1	1	1	1	1	1	1	1	1	12
P16	1	1	1	1	1	1	1	1	1	1	1	1	12
P17	1	1	1	1	1	1	1	1	1	1	1	1	12
P18	1	1	1	1	1	1	1	1	1	1	1	1	12
P19	1	1	0	1	1	1	0	1	1	0	0	1	8
P20	1	1	1	1	1	1	1	1	1	1	1	1	12
P21	1	1	1	1	1	1	1	1	1	0	1	1	11
P22	1	1	1	1	1	1	1	1	1	1	1	1	12
P23	1	1	1	1	1	1	1	1	1	1	1	1	12
P24	1	1	1	1	1	1	1	1	1	1	1	1	12

P25	1	1	1	1	1	1	1	1	1	1	1	1	12
P26	1	1	1	1	1	1	1	1	1	1	1	1	12
P27	1	1	0	1	1	0	1	1	1	0	1	0	8
P28	1	1	1	1	1	1	1	1	1	1	1	1	12
P29	1	1	1	1	1	1	1	1	1	1	1	1	12
P30	1	1	1	1	1	1	1	1	1	1	1	1	12
P31	1	1	0	1	1	1	1	0	1	0	1	0	8
P32	1	1	1	1	1	1	1	1	1	1	1	1	12
P33	1	1	1	1	1	1	1	1	1	1	1	1	12
P34	1	1	0	1	1	1	1	1	1	1	1	0	10
P35	1	1	1	1	1	1	1	1	1	1	1	1	12
P36	1	1	1	1	1	1	1	1	1	1	1	1	12
P37	1	1	1	1	1	1	1	1	1	1	1	1	12
P38	1	1	1	1	1	1	1	1	1	0	1	1	11
P39	1	1	1	1	1	1	1	1	1	1	1	1	12
P40	1	1	1	1	1	1	1	1	1	1	1	1	12
P41	1	1	1	1	1	1	1	1	1	1	1	0	11
P42	1	1	1	1	1	1	1	1	1	1	1	1	12
P43	1	1	1	1	1	1	1	1	1	1	1	1	12
P44	1	1	1	1	1	1	1	1	1	1	1	1	12
P45	1	1	1	1	1	1	1	1	1	1	1	1	12
P46	1	1	1	1	1	1	1	1	1	1	1	1	12
P47	1	1	0	1	1	1	0	1	0	1	1	0	8
P48	1	1	1	1	1	1	1	1	1	1	1	1	12
P49	1	1	1	1	1	1	1	1	1	1	1	1	12
P50	1	1	1	1	1	1	1	1	1	1	1	1	12
P51	1	1	0	1	1	1	1	1	1	1	1	0	10
P52	1	1	1	1	1	1	1	1	1	1	1	1	12

Master sheet of socio demographic variable with Practice

Code No.	D1	D2	D3	D4	D5	D6	D7	D8	D9	PRACTICE
P1	3	1	4	2	2	1	2	3	2	12
P2	3	1	2	2	2	1	2	3	2	12
P3	2	2	2	1	2	1	2	3	2	12
P4	3	1	2	1	2	1	2	3	2	9
P5	1	1	2	1	2	1	1	3	2	10
P6	1	2	2	1	2	1	2	3	2	10
P7	2	1	2	2	2	1	2	3	2	12
P8	2	1	2	1	3	1	2	3	2	12
P9	3	1	2	1	3	2	2	3	2	12
P10	2	2	2	1	3	1	2	3	2	12
P11	3	1	2	2	2	2	2	3	2	12
P12	2	2	2	1	2	1	2	3	2	12
P13	4	1	2	1	3	2	2	2	2	12
P14	3	1	2	1	2	2	2	3	2	12
P15	2	1	2	1	2	2	2	3	2	12
P16	1	2	2	1	4	1	2	3	2	12
P17	3	1	2	2	2	2	2	3	2	12
P18	2	2	1	1	2	2	2	3	2	12
P19	4	1	2	1	4	2	2	3	2	8
P20	3	1	2	1	2	2	2	3	2	12
P21	1	2	2	1	3	1	2	3	2	11
P22	2	1	1	1	2	2	2	3	2	12
P23	1	2	2	1	4	1	2	3	2	12
P24	1	2	2	1	1	1	2	3	2	12
P25	2	1	2	2	2	1	2	3	2	12

P26	3	1	2	2	3	1	2	3	2	12
P27	2	2	3	1	2	1	2	3	2	8
P28	3	1	2	1	2	1	2	3	2	12
P29	2	2	2	1	2	1	2	3	2	12
P30	2	1	2	2	2	1	2	3	2	12
P31	1	1	2	1	2	1	2	3	2	8
P32	2	1	2	2	2	1	2	3	2	12
P33	2	1	2	1	2	1	2	3	2	12
P34	2	1	2	1	2	2	2	3	2	10
P35	2	1	2	2	2	2	2	3	2	12
P36	3	1	2	1	3	2	2	3	2	12
P37	2	2	2	1	2	2	2	3	2	12
P38	1	2	2	1	2	1	2	3	2	11
P39	2	1	2	1	3	1	2	3	2	12
P40	2	2	2	1	4	1	2	3	2	12
P41	3	1	4	1	2	1	2	3	2	11
P42	3	1	2	1	2	1	2	3	2	12
P43	1	1	2	1	2	1	2	3	2	12
P44	3	1	2	1	3	2	2	3	2	12
P45	2	2	7	4	2	1	2	3	2	12
P46	3	1	5	3	3	1	2	3	2	12
P47	2	1	5	3	2	1	2	3	2	8
P48	2	1	5	3	2	2	2	3	2	12
P49	1	1	5	3	4	1	2	3	2	12
P50	3	1	5	3	2	2	2	3	2	12
P51	2	1	5	3	2	1	2	3	2	10
P52	1	2	5	3	2	1	2	3	2	12